Metropolitan Borough of Bethnal Green.

PUBLIC LIBRARIES.

LENDING LIBRARY.

No. 39172 Class No. 4926

The Lending Library shall be open to the public for the issue and receipt of books from 10 a.m. to 8 p.m. daily, excepting Wednesdays, Sundays, Good Fridays, Christmas Days, all public holidays, and such other days as the Committee may from time to time direct.

Books may be retained fourteen days from the date of issue and are due back on the same day of the week as that on which they were issued. A fine of one penny per week or portion of a week during which the book may be detained beyond that period will be charged.

WITHDRAWN from Public Library

Borrowers are required to keep the books clean. They are not to turn down the leaves nor to make pencil or other marks upon them. They are particularly requested to note and report any damage, missing pages, or other imperfections which they may notice, otherwise they will be held responsible for the value of the same. In wet weather borrowers are required to protect the books in their transit to and from the Library.

No book can be issued without the production of a Borrower's ticket, nor will books be issued to messengers whom the Librarian may consider not qualified to take proper care of them. No book will be exchanged on the same day as issued.

Any change in the residence of Borrowers or their Guarantors must be notified to the Librarian within one week of such change.

Borrowers leaving the district, or ceasing to use the Library, are required to return their tickets to the Librarian for cancellation, or they and their Guarantors will be held responsible for any books taken out on such tickets.

NOTIFICATION OF INFECTIOUS DISEASE.

No person shall take out of the Library any book for use in any house in which there is a person suffering from infectious disease, and no person shall return to the Library any book which has been exposed to infection from any infectious disease, but shall at once give notice to the Medical Officer of Health that it has been exposed to infection, and leave the book at the Office of the Medical Officer of Health, or hand it over to any Sanitary Inspector acting on his behalf, who shall cause the same to be disinfected, and then returned to the Library or destroyed. In the interests of public health this regulation will be strictly enforced, and offenders will be prosecuted according to statute. Borrowers may resume borrowing books after their houses have been disinfected.

No. 190. W. & S. Ltd. 10m 4-25

LONDON BOROUGH OF LEWISHAM
LIBRARY SERVICE

Author

Title

BOOK STORE

Books or discs must be returned on or before the last date stamped on label or on card in book pocket. Books or discs can be renewed by telephone, letter or personal call unless required by another reader. After library hours use the Ansafone Service (01-698 7347). For hours of opening and charges see notices at the above branch, but note that all lending departments close at 1 pm on Wednesday and all libraries are closed on Sundays, Good Friday, Christmas Day, Bank Holidays and Saturdays prior to Bank Holidays.

METROPOLITAN
SPECIAL COLLECTION

Digitized by the Internet Archive
in 2026

https://archive.org/details/storyofarchitect0000eagr

942·5738

THE STORY OF ARCHITECTURE IN OXFORD STONE

BY

E A. GREENING LAMBORN

OXFORD
AT THE CLARENDON PRESS
1912

METROPOLITAN BOROUGH
PUBLIC
LIBRARIES
OF BETHNAL GREEN

942.57:720

HENRY FROWDE
PUBLISHER TO THE UNIVERSITY OF OXFORD
LONDON, EDINBURGH, NEW YORK
TORONTO AND MELBOURNE

MSC
U726
Cat

PREFACE

This book is not meant to be an addition to the already numerous guides to the individual buildings of Oxford. As such it could find little justification, since every important building has at some time or other been the subject of a book, in which its history and its architectural features have been exhaustively treated, and there are besides several guides to the city as a whole, in which accounts are given of its chief architectural details with the dates and styles of all the colleges and churches.

Not Oxford's buildings, but the science of architecture illustrated by them, is the subject of this essay.

As a rule, writers on English architecture draw their examples from buildings scattered broadcast over England; the majority of students must, therefore, be content to make acquaintance with their details through the medium of photographic illustrations, drawings, and descriptions, which are at best a poor substitute for the real thing. Now Oxford, a unique city in so many respects, is unique in this, that all the great architectural types are represented in her buildings. It is true that our examples of Classic architecture are but poor imitations of the stately porticoes of Greece and Rome, but they will still serve to illustrate the mechanical principles and the ornamental details of the ancient building systems; of every stage of mediaeval architecture Oxford possesses examples as representative of the best work as are to be found anywhere in England; the buildings of the great Renaissance

architects are not better represented in London itself than in the streets of our own city; and finally, it was Oxford that saw both the last efforts of expiring Gothic and the first attempts at the revival of the mediaeval style.

Here, then, is an opportunity to approach the study of architecture with buildings of every period at hand for illustrations; I have tried to show how they may be used to illustrate the development of the science from primitive to modern times.

My main purpose has been less to describe the characteristics of the work of different dates than to attempt to trace through the successive styles a continuous line of evolution. Therefore, minute descriptions of details that the reader may observe for himself are unnecessary; the aim was rather to inquire into their origins and functions, and to follow the history of their development.

Ability to recognize the work of different periods in an old building, and to trace in chronological sequence the history of the structure is not very difficult to acquire, and adds greatly to one's capacity for feeling the mysterious charm of ancient things. But it involves no more real knowledge of architecture than the recognition of the signs of age in a human being involves a knowledge of physiology. The deeper intellectual interest of the science is to be found, not in the naming and classification of details, but in the study of their functions, and of the adaptations of their forms to the ends they are intended to serve; it is a physiological interest.

This book is, in its small way, an attempt to apply to the study of architecture the methods of modern biology: to trace the origin and development of architectural forms; to explain their functions and their inter-

relations ; and to seek out the causes that modified them and controlled their development. It proceeds on the premisses that architecture is analogous to an organic growth, that its study should therefore be approached from a genetic and evolutionary standpoint, the student seeking to explain its development by reference to the changes in human circumstances, just as the biologist seeks to explain the development of species from simple to complex, not by the theory of special creations, but by the effects of environment upon the organism. The old botanist was content when, from observation of outward resemblances, he had referred a plant to its natural order ; to the post-Darwinian, classification is not the association of like forms, but the relating of species to a common ancestor ; he is not satisfied until he has explained the differences between related species by reference to the varying circumstances of their environments. The belief that each species sprang into existence by a separate act of the Creative Mind has given place to the nobler theory of evolution from a single primitive form of life.

I have tried to apply the evolutionary method to the study of architecture, and to show that in the history of building, as in that of organic life, there is a single primitive type from which all later forms were evolved ; that all the varied styles belong to one or other of a few great branches ; that the line of progress is from simple to complex, from the lowly organism to the high ; from the undifferentiated form to the specialized, from the rudimentary to the highly developed ; and that the changes that mark that progress were the results, not of changing fashions or of the caprice of individual architects, but of the pressure of new circumstances.

Of the many writers to whom I am more or less indebted, I owe the largest amount of gratitude to three: Mr. Garbett, whose *Principles of Design in Architecture*, probably the most philosophically written treatise on the subject, first suggested to me the idea of evolution in architecture; Mr. Bond, who, in his great work, *Gothic Architecture in England*, has analysed that system with a completeness that must make all later writers his debtors; and Mr. Jackson, whose book, *Reason in Architecture*, has been full of suggestion for me, and whose accounts of S. Mary's and Wadham have provided me with much information. I have to thank the Dean of Christ Church and the Wardens of Merton and New Colleges for permission to take photographs. Finally, I owe to Mr. R. W. Chapman, and to my friend Mr. C. R. L. Fletcher, most grateful acknowledgement of wise and helpful criticism in the manuscript stage of the book.

CONTENTS

PAGE

INTRODUCTION 13–17

I. What is Architecture? 13

II. Roof-making 14

PART I

THE HISTORY OF ARCHITECTURE 19–92

CHAP.

I. Ancient Architecture 19

II. The Invention of the Arch 33

III. Romanesque Architecture 42

IV. Gothic Architecture 55

V. The Renaissance and After 72

VI. The Gothic Revival 80

PART II

THE GRAMMAR OF ARCHITECTURE 93–285

Introductory 93

I. The Plan and Elevation 94

II. The Vault 109

III. The Buttress 124

IV. The Arch 131

CHAP. PAGE

V. The Pier 143
VI. The Roof 159
VII. The Wall 174
VIII. The Doorway 186
IX. The Window 195
X. The Window (*continued*) 214
XI. The Window (*concluded*) 224
XII. Architectural Ornament 233
XIII. Armory in Architecture 256
XIV. The Interior Arrangements in Mediaeval Buildings 266
Index 286

LIST OF ILLUSTRATIONS

FIG.		PAGE
1.	Doric Order	25
2.	Ionic Order	27
3.	Corinthian Order	29
4.	Classic Mouldings	31
5.	Sheldonian Theatre	37
6.	Barrel Vault	38
7.	Groined Cross-vault	39
8.	Saxon Arch in Cathedral (*c.* 727)	45
9.	The Castle Mound (*c.* 912)	47
10.	S. Michael's Tower (*c.* 1071)	48
11.	Iffley Church, West Front (*c.* 1160)	51
12.	The Castle and Mill	53
13.	Interior of Cathedral	59
14.	S. Giles's Church (*c.* 1220)	61
15.	The Chapel, Merton College (*c.* 1297)	63
16.	The Cloisters, New College (*c.* 1386)	64
17.	The Divinity School (*c.* 1450)	67
18.	Vault of Divinity School	69
19.	The Quadrangle, Oriel College (1637)	71
20.	The Quadrangle, S. John's College (*c.* 1630)	73
21.	Clarendon, Sheldonian, and Old Ashmolean Buildings	75
22.	All Saints' Church (*c.* 1709)	77
23.	Seventeenth-century House, Balliol College	81
24.	Bishop King's Palace	83
25.	Exeter College Chapel	85
26.	New Examination Schools	87
27.	Central Spire of Cathedral (*c.* 1250)	96
28.	The Monastic Plan	101

FIG. PAGE
29. Typical Gothic Elevation 107
30. Crypt of S. Peter's in the East (*c.* 1120) . . 111
31. Vault of Chancel, S. Peter's 112
32. Vault-rib: Primitive Type 114
33. Vault-rib: Typical Norman 114
34. Vault-rib: Transitional 115
35. Vault-rib: Early English 115
36. Vault-ribs in Cathedral 117
37. Latin Chapel, Christ Church (*c.* 1350) . . . 119
38. Staircase, Christ Church (1640) 121
39. Norman Buttress 125
40. Iffley Church, East End (*c.* 1160) . . . 127
41. Buttress, S. Mary Magdalene (*c.* 1337) . . 128
42. Buttress, Divinity School (*c.* 1450) . . . 130
43. Lancet Arch 134
44. Equilateral Arch 134
45. Drop Arch 134
46. Ogee Arch 134
47. Four-centred Arch 135
48. Late Four-centred Arch 135
49. Fourteenth-century Doorway, Witney . . . 135
50. Interior of S. Mary's (*c.* 1488) 137
51. Priest's Door, S. Thomas's (*c.* 1220) . . . 139
52. Arch Construction, Roman Method . . . 141
53. Arch Construction, Mediaeval Method . . 142
54. Arch and Piers, S. Mary's, A.D. 1488 . . . 144
55. Thirteenth-century Piers, S. Peter's . . . 146
56. Thirteenth-century Pier, Holywell Church . . 147
57. Tower Piers, Merton College (*c.* 1290) . . . 149
58. Cushion Capital, Cassington (*c.* 1140) . . . 150
59. Scallop Capital (*c.* 1160) 150
60. Capital in Cathedral (*c.* 1180) 151

FIG. PAGE
61. Pier of Chancel Arch, Elsfield (*c.* 1200) . . 153
62. Capital (*c.* 1220) 154
63. Capital, Merton College Chapel (*c.* 1280) . . 155
64. Pier, S. Mary's, A.D. 1488 156
65. Fifteenth-century Base, S. Mary's, A.D. 1488 . 158
66. S. Peter's in the East 162
67. The City Wall 167
68. S. Mary Magdalene Church (*c.* 1337) . . . 169
69. North Transept, Merton College Chapel (*c.* 1420) . 178
70. Norman String-course (*c.* 1100) 179
71. Transitional String-course (*c.* 1180) . . . 179
72. Early English String-course (*c.* 1220) . . 180
73. Decorated String-course (*c.* 1300) . . . 180
74. Perpendicular String-course (*c.* 1450) . . . 181
75. Linen Panelling (*c.* 1500) 185
76. South Door, Iffley Church (*c.* 1150) . . . 187
77. Thirteenth-century Doorway, Milton (*c.* 1240) . 189
78. Early Fourteenth-century Doorway, Dorchester . 190
79. Tower of the Five Orders 191
80. Fifteenth-century Doorway, Merton College Chapel, A.D. 1424 192
81. Queen's College Gateway (*c.* 1710) . . . 194
82. Norman Window, Sandford (*c.* 1100) . . . 200
83. Late Norman Window, Cathedral (*c.* 1186) . . 201
84. Late Norman Window, Sutton (*c.* 1170) . . 202
85. Lancet Window (*c.* 1220) 203
86. The Germ of Tracery, S. Giles's (*c.* 1200) . . 206
87. Early Tracery, Woodstock (*c.* 1240) . . . 207
88. Early Tracery, S. Giles's (*c.* 1265) . . . 208
89. Geometrical Tracery, Merton College Chapel (*c.* 1297) 210
90. Very Early Bar-tracery, Northmoor Church (*c.* 1270) 211
91. Window, S. Michael's (*c.* 1260) 213

FIG. PAGE
92. Window, S. Michael's (*c.* 1320) 216
93. Window, S. Mary Magdalene (*c.* 1337) . . 217
94. Window, S. Peter's in the East (*c.* 1360) . . 221
95. Fifteenth-century Window, S. Mary's . . 222
96. Jacobean Windows, S. John's College . . 227
97. Cowley Church 229
98. Ruined Shrine of S. Frideswide (*c.* 1289) . . 235
99. Chevron Ornament 242
100. Chevron Ornament 242
101. Norman Pellets 243
102. Dog-tooth Ornament 243
103. Beak-heads 244
104. Beak-heads, S. Ebbe's Church 244
105. Thirteenth-century Hollow Moulding . . . 245
106. Ball-flower Ornament, Prior Sutton's Tomb (*c.* 1300) 246
107. Fillets 247
108. Canopies of Sedilia, Merton College Chapel (*c.* 1300) 249
109. Ogee Moulding (*c.* 1350) 250
110. Double Ogee, Fifteenth Century . . . 250
111. Fifteenth-century Hollow Moulding . . . 251
112. Sedilia, S. Mary's (*c.* 1488) 253
113. Schools Gateway 254
114. The Ordinaries of Armory 259
115. Thirteenth-century Fireplace, Abingdon Abbey . 269
116. Chimney Turret, Abingdon Abbey (*c.* 1250) . 271
117. Wall-painting, South Leigh 277
118. Squints at Haseley 279
119. Seventeenth-century Woodwork, Cumnor . . 281
120. Flat Gravestone, Great Milton, Oxon. (*c.* 1250) . 283
121. Tomb, Waterperry, Oxon. (*c.* 1400) . . . 284

METROPOLITAN BOROUGH
PUBLIC
LIBRARIES
FINSBURY

INTRODUCTION

I. What is Architecture?

'Piety, Socrates, everybody knows what that means.' So, probably, everybody knows what architecture means—until he comes to define it. Then most people would find, that while they were able at once to recognize whether or not a building possessed the character of architecture, they could much less readily declare in what attributes that character consisted. One could easily make a list of buildings certainly architectural, and another of buildings certainly not so, but one might have considerable difficulty in stating the grounds upon which a particular building was placed in either list. It will be neither uninteresting nor unprofitable to pause at the outset and try to find out definitely what element it is in certain buildings that invests them with the quality of architecture.

It has been said that, strictly speaking, all building is architecture; it might as truly be said that all writing is literature. All building has for its prime purpose the satisfaction of the first physical need of civilized man—the provision of shelter for himself and his belongings: so *utility* is a characteristic common to all. But while a mere builder is concerned wholly with the practical uses his work is designed to serve, and is content according to the degree in which his building answers its purpose, the architect is not content to provide for physical needs alone; another ideal disputes with utility the possession

of his mind, and his building not only satisfies the physical desire for comfort and convenience, but gratifies also the higher human instinct by which man craves naturally for seemliness and dignity in his surroundings.

In those buildings to which we apply the term architectural there is the recognition of the deep truth that man doth not live by bread alone, that a building is a part of man's spiritual environment as well as a shelter for his body, and that the dignity of humanity demands for a human dwelling-place a certain excess of design and workmanship beyond what is required to produce a convenient and comfortable building. That recognition I believe to be the fundamental characteristic of what we call architecture, the touchstone by which it may be distinguished from mere building. Building is the art of constructing *animal* dwellings; it is not confined to the human species. Architecture arose when man first began to realize his higher nature; it is the art of constructing buildings that satisfy *human* needs.

II. Roof-making

Architecture is the oldest of the arts, for we have seen that it had its origin in the first need of civilized man, a roof to shield him from the weather. To construct a roof is the essential function of architecture. All the various parts of a building, however complex, are built in relation to the roof and subordinate to it; the walls or pillars that support it and enclose or subdivide the space roofed by it, the buttresses that take its thrust, the windows that light and the doorways that give access to the space it covers, all are governed in their construction by the dominating feature that fulfils the essential purpose

of the building. Fundamentally true is the figure of speech that makes 'roof' do service for a whole homestead.

This is no idle analysis, but the necessary elucidation of a primary fact, upon the realization of which depends the comprehension of the whole science of the architectural styles. For the great building systems of the world are distinguished, not by details, but by fundamentals—by their method of solving the first problem of architecture, how to build a roof over a given space.

Three solutions have been evolved in the course of human history; and there are, therefore, only three great architectural styles.

The first solution was arrived at before the dawn of history; it was the very simple and obvious plan of making a horizontal roof of long poles covered with a layer of rushes and supported upon stout posts. Even in the twentieth century many a cart-shed or cattle-shelter in a field-corner may be seen roofed in this primitive fashion with poles covered by brushwood. At first the waterproof layer would be a solid mass of rushes with its sides sloped to throw off the rain; but soon would be discovered the plan of constructing a sloping framework of light poles covered with a skin of thatch to set upon the flat roof, and so to save rushes.

Except that tiles and slates have been substituted for thatch, this earliest type of roof, formed by horizontal beams supporting a sloping framework of rafters, has persisted until to-day, and covers most of our modern buildings. The horizontal principle is disguised by the sloping tiles that hide the beams, but it is revealed in the flat ceiling. Every building with a flat ceiling belongs to the primitive or trabeated system; it is constructionally

a 'post and lintel' building, i.e. its roof is a dead weight exerting a *vertical* pressure upon its supports.

The earliest architecture was, of course, timber construction. But long before recorded history man learned to substitute stone for wood, and so to make more dignified and durable dwellings. The change in material was a great step forward; it involved eventually a change in constructive method; but many ages had to pass before this was realized and a new system invented. Those who have seen Stonehenge or Weyland Smith's cave will have noticed that in these primitive attempts at stone architecture man followed the only plan of roof-making he yet knew, merely substituting stone columns for wooden posts, and great flat slabs for the rush-covered beams.

But it was in Egypt, the cradle of civilization, that architecture was developed into a science. Egypt had little wood, but was rich in stone, and so her people were forced into stone construction. The only method of roof-making they knew was that of posts and beams; they therefore built their temples with flat stone roofs supported by massive columns. They were not driven by difficulties of material to evolve a new method, for their stone was of such a nature that it could be extracted in pieces of sufficient length; great monoliths for the columns, broad flags for the roof, and long masses for lintels, were all available; and labour was plentiful. Young Greece found her architectural models in Egypt. The spirit that was in her caused her to beautify them and so to produce the Greek temples. But, again, no difficulties of material forced her architects to devise a new system. She perfected the style of lintel and column, and she passed it on to Rome.

For a century or two the mistress of the world ransacked her dominions for the monoliths and great stone beams necessary for a trabeated system of architecture. Then even her vast resources began to fail, and the builders were driven to invent a system of roofing in which stones of ordinary size could be used. They substituted the arch and the vault for the lintel and the beam. So the second great style of architecture came into existence, the architecture of the round arch, the architectural legacy of Rome to the modern world.

For a thousand years the round arch dominated architecture. Then, just at the time when the modern nations were coming into individual existence, the builders of Western Europe discovered the pointed arch, and applied it to a new system, the last and noblest, Gothic architecture, which gave us

> Minaret crowned S. Mary's and Magdalen tower and Merton,

and all the dreaming spires that beautify our sweet city.

The person to whom this book is loaned is responsible for keeping it CLEAN and UNDAMAGED.

Any MARK, IMPERFECTION or MUTILATION discovered whilst reading this or any other volume belonging to the Library must be pointed out to the Librarian or his Assistant immediately on its return; otherwise the reader will be answerable for the replacement of the damaged volume.

J. RADCLIFFE,
Borough Librarian.

To understand the architectural styles represented in Oxford's buildings some knowledge of ancient architecture, and especially of Greek architecture, is necessary. Rome learned the art of building from the Greeks, and imparted it in turn to her successors with her own amendments, upon which they again improved. From Greek temple to Roman basilica, from basilica to early Christian church, and from thence through rude Saxon and barbaric Norman to the perfect loveliness of Ely or Lichfield there is true organic unity.

We have in Oxford no examples of the handiwork of the ancient civilizations, and no reproductions of it earlier than the seventeenth century. Most architectural handbooks, therefore, defer any account of the Classic styles until they come to consider the work of the Renaissance architects. But the evolutionary method demands that the mediaeval styles should be studied in the light of those that preceded them.

I shall, therefore, devote the first section of the book to a brief description of the ancient styles, to a discussion of the difficulties inherent in the lintel system, and of the manner in which these were overcome by the employment of the arch, concluding with an account of the arcuated

system of the Roman builders, out of which the mediaeval styles developed.

It will be convenient to interpolate here a few remarks on the architectural vestiges of the Roman occupation of this part of Britain. They are very few, and consist only of foundations. It is highly improbable that a Roman ever even set foot upon the actual site of Oxford. Two great roads ran through the district from London to Cirencester; one, the Akeman Street, left Oxford eight or nine miles to the south; the other, passing through Silchester, left it thirty miles to the north. A small connecting road[1] ran north from Silchester, through Dorchester to join the Akeman Street near Bicester; this road passed over Shotover Hill, and no doubt many a Roman legionary, toiling up the steep slope from Bayswater, must have halted on the crest to breathe himself and to look westward down into the misty hollow where now the city is cradled. In the hedge near the brick works, just where the Roman road crosses the old London highway, there is a great stone that may well have been a Roman milestone. In the middle of Otmoor there is another, now broken, marked on the Ordnance Map as Joseph's stone.

Traces of Roman country-houses have been found at many places along the lines of the three roads. These sites are marked on the Ordnance Maps. The only places at which remains are still to be seen are North Leigh, where there is a fine Roman floor now protected by a roof, and Widford, where the little church stands upon

[1] It can still be followed, *experto crede*, from Bullingdon Green to Dorchester; but northwards it has been obliterated by the quarries of Headington, or has sunk beneath the marshes of Otmoor.

the site of a Roman villa, and has part of a tesselated pavement in the floor of the chancel.

Excavations of the sites show that the villa was usually built round three sides of a quadrangle, one block forming the house, another the stores and stables, and the third the kitchens, baths, and offices. The villas were inhabited, not by Romans, but by Romanized Britons, and, in spite of their tesselated floors and hypocausts, were rather of the native than of the Roman type of architecture, being built mainly of wood and of one story.

Judging by the remains preserved in our museums there were very few buildings in Roman Britain at all representative of Classic architecture. But the buildings of the Renaissance period in Oxford will give a very good idea of the principles and details of the ancient style, and from them our examples will be drawn.

Greek architecture was a system of constructing buildings with flat roofs supported by columns upon which their weight exerted a vertical pressure. It is therefore a post and lintel system, the posts and beams of the older timber construction being replaced by columns and long slabs of stone or marble. The mechanics of the Greek temple are as simple as those involved in the construction of a cart-shed ; if the reader will imagine a billiard-table with its slate bed removed, he will see in the remaining framework all the structural parts of a Greek building. The legs of the table represent the columns, the oblong frame supported by them corresponds to the entablature upon which the flat roof rests ; the walls are not structural, but are merely screens enclosing an oblong space within the peristyle ; in the porches they were omitted altogether, as in the porch of the Ashmolean Museum, and in many temples the

space enclosed by walls was only a very small one in proportion to the area covered by the roof; there were no windows, and the heads of the doorways were, of course, square, being formed by a lintel spanning the opening from jamb to jamb.

The working parts—i. e. the roof-bearing parts—of a Greek building are therefore the entablature and the columns. If the reader will think again of the frame of a billiard-table, he will find that its entablature is formed of three portions; there is first the edge of a board resting face downwards upon the legs; above this is the broad plain face of another board set edgeways upon the first; and projecting over this face is the topmost member in which the openings for the pockets are cut. Similarly, in the entablature of a Greek building there are three divisions: the architrave or lintel proper which rests upon the columns; the frieze, a broad band of ornament hiding the ends of the rafters; and the cornice or projecting member which crowns the whole. These divisions will be plain from the illustrations, and may be recognized in the entablature of the Ashmolean Porch or in the Clarendon Building.

The columns also consist of three parts, the shaft, the base, and the capital. Since they support only a vertical pressure the shafts taper from the base upwards; they are circular because that form offers least obstruction to the view, and their surface is fluted in order that they may not appear flat against the dazzling sunlight of Greece.

The flat roof resting upon the entablature was usually composed of marble slabs. Occasionally it was exposed externally and formed an outdoor platform, but, as a rule, it was protected by an outer framework of timber covered with tiles.

Three types of columns were used by the Greeks, each carrying its own proper entablature; as a rule, only one type was used in a single building. All the columns of a particular type conformed strictly to fixed proportions, whether they were large or small; their capitals were all nearly identical in form and ornamentation; and all their shafts were channelled with the same number of flutes. Similarly, the entablature belonging to any type was almost identical in its proportions and ornaments with every other entablature of that type. From a single carved fragment of a Greek building it would be possible to state its order and almost to make a drawing of the whole column and entablature to which it belonged.

On account of this strict uniformity in the parts of each the three types are known as Orders. They will be described and illustrated in the latter part of the chapter.

In its lack of variety Classic architecture contrasts strongly with that of the Middle Ages. Ruskin and William Morris held that the stereotyped forms of much of its ornamentation and the almost mechanical accuracy of their execution reflect the fact that Greek architecture, like Greek civilization in general, depended upon slave-labour. Among the ancients, as among ourselves, the design of a master-builder (*architekton*), worked out in every detail, was executed by workmen whose interest and responsibility were limited to the faithful reproduction of the forms they were set to copy. But every craftsman upon a mediaeval building was in a rude way an artist also, and had his opportunity of leaving upon it the mark of his own individuality. In all the minor details he had a free hand. But the resulting mixture of forms, crude and refined, well cut and ill, grotesque, absurd, graceful, varying with the varying capacities of different

workmen, would have been foolishness to the Greek as it was to the scholars of the Renaissance. Nevertheless, it is that variety, full of surprise, making its appeal now to the sense of wonder, now to that of beauty, and in the very next carving to that of the ridiculous, that gives to mediaeval ornament its never failing charm.

The Orders

The three Orders of Greek architecture were the Doric, the Ionic, and the Corinthian. All three were copied by the Roman architects, who also devised for themselves two other Orders, known as the Tuscan and the Composite. Illustrations are given of the five types, and therefore only a short account of each will be necessary. The oldest of the Classic Orders is the Doric; it perhaps finds its prototype in the columns of the tomb of Beni Hassan in Egypt. It is the most massive of the Orders, its sturdy columns being only about six times greater in height than in diameter, and they are therefore, in themselves, so impressive as to need no base, but they are sometimes mounted on two or three steps. The shaft is fluted with twenty channels, so arranged that a sharp ridge or arris divides each from the next. The abacus of the capital is a plain square slab. The architrave, representing the original wooden lintel, is also plain, and upon it rests the frieze which is ornamented with the characteristic triglyphs, projecting blocks, each channelled with two *glyphs* or furrows in the middle and with a half-furrow on its side edges. These are considered to have been derived from the projecting ends of the wooden roof-beams once resting at right angles on the

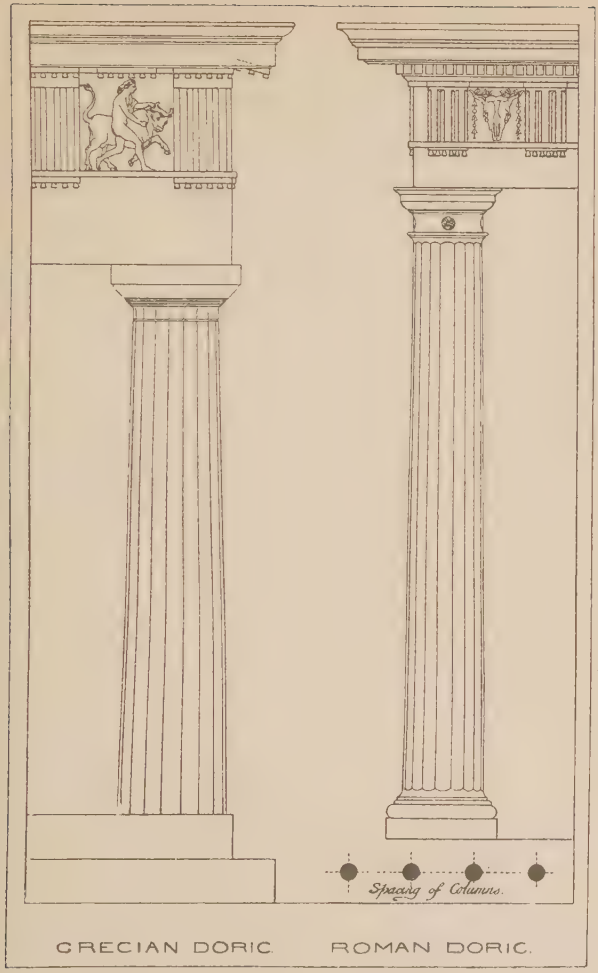


FIG. 1. DORIC ORDER

lintel. The spaces between the triglyphs are called metopes, and in the best Greek examples were filled with sculptured figures in relief. The Romans, with the lack of artistic feeling that made them so successful in other directions, substituted oxen's skulls for the figure sculpture they were incapable of copying. Beneath the triglyphs are peg-like ornaments called guttae, supposed to represent the wooden pegs with which the parts of a timber building are held together. Under the cornice, which represents the eaves, is a range of blocks called mutules, suggesting the projecting ends of rafters.

Although the details of this earliest Greek Order do suggest an origin in timber construction, they must not be regarded as meaningless survivals retained by unintelligent builders; the truth lies the other way: details which had become useless structurally were transformed and utilized ornamentally, and they in no way resemble the tentative efforts of a craftsman in wood working in a new material. Some writers even refuse to admit that they are constructive in origin since they are so artistically *right* for their purpose; such writers point to the flutes of the shaft—which were undoubtedly cut for purely artistic reasons, but which imaginative persons have supposed to be designed for spear-rests—and apply the obvious argument to the other details.

We have no building of the pure Doric form in Oxford, for the Renaissance architects, of course, copied the Roman forms. The Clarendon Building is of the Doric type, and there are Doric columns in the façade of No. 86 High Street.

When the Romans came to use this Order they spoilt it by altering its proportions, lengthening the shaft and narrowing the architrave, and by omitting the sculpture

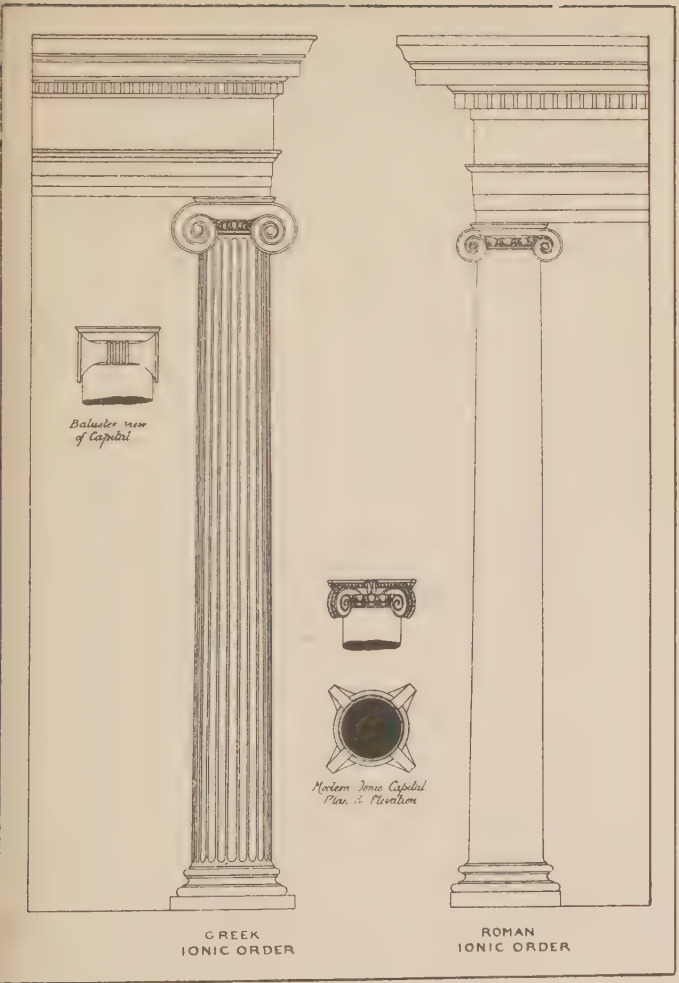


FIG. 2. IONIC ORDER

and the flutes. Then, dissatisfied with the result, they so modified the original form as to produce what has been named as a new Order, the Tuscan, though it is really a plain form of Doric with the ornaments omitted and a pedestal added to the column. It is represented in modern Oxford in a diminutive form by the columns of the drinking-fountain on S. Clement's Plain.

The Ionic Order is much lighter than the Doric; its columns are slender, usually about nine diameters in height, and are widely spaced; they are fluted with twenty-four channels, separated by flat fillets; they stand on what is known as the Attic base, consisting of two torus mouldings, bold rounds, separated by a hollow called a scotia; an ornament of interlacing circles, called the guilloche, is often carved upon the lower and larger torus. The Ionic capital is distinguished by large volutes at its corners, derived probably from Persian architecture, in which the spiral was always a favourite decorative form. Between the two volutes is carved the echinus or egg and dart ornament, afterwards used profusely by the Renaissance builders in cornices, string-courses, and many other places. The frieze is sometimes plain, sometimes filled with figure sculpture. Beneath the cornice is a row of oblong blocks called dentils; they replace the mutules of the older Order.

The Romans made little use of this Order, and so it changed little in their hands. They reduced the size of the volutes and the number of curls in the spiral, and so spoilt the capital; they omitted the flutes on the shaft, and increased the projection of the cornice and the size of the dentils.

The volute, the most striking feature of the Ionic Order, perhaps of any Order, is the most persistent

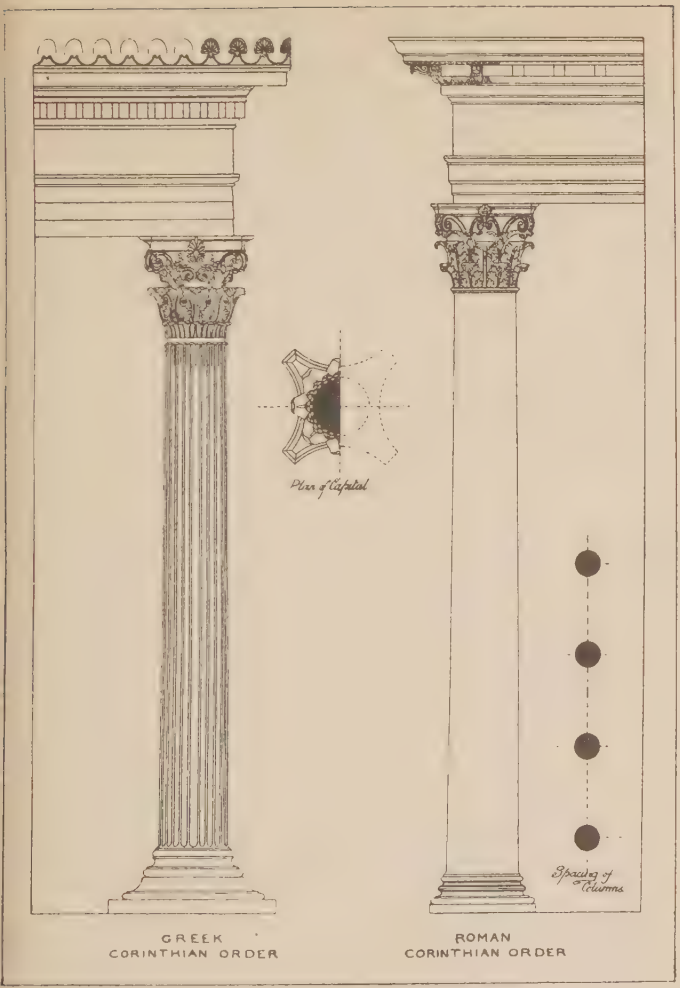


FIG. 3. CORINTHIAN ORDER

ornament in architecture; old in Egypt, it was copied by the Persians, and adopted by the Greeks in two of their three Orders; our own forefathers played with it in later times, at first essaying rude copies and then transforming it, as their skill increased, into a knob of opening foliage. At its ultimate origin we can only guess; but we know that primitive basket-work was coiled, not woven, and that the earliest pottery was similarly formed by strips of clay wound in a spiral round a whorled nucleus.

Our best example of the use of the Ionic Order in Oxford is in the Taylorian Building in Beaumont Street; this was built by Cockerell in 1846, and represents the Greek form of the Order. S. Paul's Church has columns of the Ionic type in its western front.

The Corinthian Order is the last and most graceful invented by the Greeks, and the one most favoured by the Romans and, therefore, by later architects. Its distinguishing beauty is the capital crowned with acanthus leaves, almost the only naturalistic decoration used by the ancients. Elsewhere, distrust of or contempt for the powers of the workman limited him to the execution of simple conventional forms; but in the main feature of this Order his subject, though conventionally treated, was directly derived from a natural leaf. But the Greeks employed this Order very little.

The other details of the Corinthian Order resemble those of the Ionic, except that the top of the cornice is ornamented with a row of carved ornaments giving it a broken line. The abacus of the capital is concave at its edges, and its projecting corners are supported by leaves curled into small volutes.

The Romans made a profuse use of this Order, the

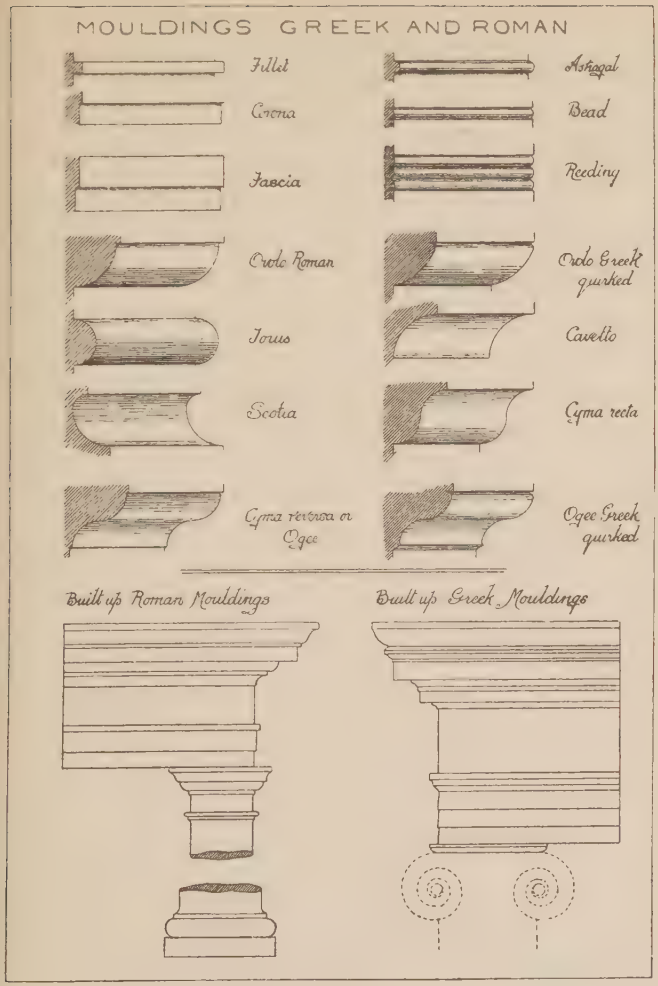


FIG. 4. CLASSIC MOULDINGS

richness of which appealed to their extravagant taste, and by enlarging the volutes and adding the egg and dart ornament to the capitals they produced a form which was afterwards classed as a new Order and named the Composite, as combining the essential features of Ionic and Corinthian. So with the three original Orders and the Tuscan and Composite we have what the Renaissance architects recognized as the 'Five Orders of Architecture'. Modern students, however, refuse to consider the Roman modifications as separate Orders.

The columns of All Saints' Church (1710) and of the Gateway of the University Press (1830) are of the Corinthian type. In the screens of some of the college chapels and libraries, e. g. in the chapel of Lincoln, columns of this Order may be seen executed in wood.

Modified forms of all five Orders are placed one above another in the five stories of the western façade of the Schools' Tower (Fig. 79), the sturdy Tuscan forming the base, and then in order the Doric, Ionic, Corinthian, and Composite. The last four may also be seen superimposed in the tower of Wadham Hall, and the tower of the Fellows' Quadrangle of Merton shows three Orders similarly arranged. All these examples are of the time of James I. In the modern front of Hertford College the Tuscan Order forms the ground floor and the Corinthian the upper story.

But it is not so much in our classical buildings that the influence of the ancients is to be discerned as in the minor details of buildings of all periods. When one has become familiar with the forms of the Orders, one recognizes their details everywhere. They were rudely imitated by Saxon and Norman, and beautifully modified by Gothic workmen; they were slavishly copied by the

Renaissance builders, so that even the tombstones in the churchyards are carved with pagan ornament; and in our own day the mouldings of our mantelpieces, our door-panels, and window-sashes, even of our picture-frames, are usually debasements of Classic forms; the very lamp-posts in our streets are derived from the Classic column. All roads in architecture lead at last to Rome.

CHAPTER II

THE INVENTION OF THE ARCH

In the middle of the second century B.C. the Romans conquered Greece, and having no national architectural style of their own, for they were apparently still in the timber stage of building evolution, they adopted the Greek Orders, and, importing Greek architects, began to make Rome a city worthy of the empire of which she was the mother.

But they were soon confronted with the difficulties inherent in the lintel system. Theirs was a complex civilization, and they needed buildings of many types; great covered spaces for public purposes, for instance, were as necessary in Rome as in London now. But the multitude of close-set columns obstructed sound and sight besides occupying valuable space; how to decrease the necessary points of support for the roof was the first problem for their architects. A complete account of the solution of that problem would be the history of building construction from the first century to the fifteenth. Again, the consideration that has in our time produced

the American 'sky-scraper', the value of surface-area in congested sites, was beginning to present itself in populous Rome; and so there was the further problem, how to construct a building of several stories, for column and lintel could bear no great weight of superstructure. And lastly, there was the question of material; the difficulties of obtaining an adequate supply of large stones for the amount of building planned and in progress were enormous. How could material of a more ordinary kind be used instead of the column and lintel? The Roman architects triumphantly overcame all these difficulties by using arches instead of lintels in their buildings.

The arch was no new invention; it had been used by the Etruscans even before the Romans became rulers in Italy, and the latter must therefore have been quite familiar with its form. But no nation had yet attempted to make it the base of an architectural system, for none had yet been driven by new conditions to seek a substitute for the lintel. Moreover, while the arch solved one problem it raised another, for, unlike the lintel, it could not be carried on columns; it tended to thrust apart its supports and so to fall with them into hopeless ruins. This must have been very discouraging to the early experimentalists; hence we find that practically all early arches are used merely to cover drains and sewers, where they carry little weight and are prevented from spreading by the sides of the trench in which they are built; the solid mass which serves this purpose is called the *abutment* of the arch: without it no arch can stand; and the Romans were the first people to understand clearly this fundamental fact in the mechanics of the arch, and to realize that, given sufficient abutment, there is practically no limit to its weight-bearing capacity. The

discovery of the arch as a weight-carrier, as the very Atlas of architecture, and the consequent substitution of the arch for the lintel, is the most important step in the history of architecture since first man laid one stone upon another to make himself a shelter.

Stones used in an arch are in a state of compression, i.e. the material is resisting just that force which its granular nature is formed to resist; stones of all sizes can be so used; and arched construction, unlike the lintel system, is therefore possible in every district where stone exists at all. After thousands of years of stone building it remained for the Romans to show mankind the true use of the material, and to prove that the natural basis of stone architecture is the arch, as that of timber construction is the beam.

But the Romans had at first no idea of inventing a new system; they admired too much the grandeur of Greek building, and had no thought of abandoning the horizontal line that gave it its repose and dignity. What they desired was to support an entablature without columns, and to the last they did not see that the idea was an absurdity, since a lintel supported along its whole length ceases to be a lintel at all.

The simple illustration of the billiard-table will help the reader to understand the new principle. It is required to get rid of the intermediate legs and to support the oblong 'entablature' without them: now if an arch is built between the end legs of each side, the middle point of the entablature will rest upon its crown; further, if a wall is raised upon the haunches of the arch to the level of the crown a continuous support will be formed, making it possible to construct the entablature in short lengths; similarly, other arches built on the other sides of the oblong

will carry the remaining sides of the entablature. But the four arches will carry the slate bed without the need for an entablature; moreover, they render superfluous the legs at the corners, and so lintel and column can alike be dispensed with. Our illustration supposes an arch springing from the ground-level and having its abutment in foundations below. But practically, of course, the entablature carries a roof, and therefore the supporting arch must spring from a level above the ground. Now, the Greek column, being either a monolith or else constructed of drums, had been formed to carry a vertical weight and not to resist the oblique thrust of an arch; a much greater mass was necessary to provide the abutment for this purpose. The Roman architect, therefore, replaced the column by a solid mass of masonry (called a pier), and built his arch upon this. But though the column was thus rendered useless, he would not abandon it, but attached it as a pilaster to the face of the pier (Fig. 5), and carried it up to the level of the entablature, making it appear as if it still performed its ancient function and supported an architrave that really rested upon the arch. Its real structural purpose in this position was to weight the pier and so provide greater abutment, but it *seemed* not to do this, and to do something else which in reality it did not do; it was therefore a constructive lie and a blemish upon the Roman system. The excuse for the Roman architects is that they could not realize their invention to be revolutionary; no such excuse can be made for the Renaissance builders, who in their blind admiration for the ancients copied the falsehood; still less can the modern imitator be excused, he is like the Hindoo shoemaker who copies the slits and patches of the boot given him for a model.

Though to the last he tried to disguise the fact, the Roman architect completely abolished the old trabeated

FIG. 5. SHELDONIAN THEATRE

system and developed to the full the new arcuated style ; he might hide it in the façade of his building, but in the essential structure, the roof, the triumph of the arch

was clear and unmistakable: there was a revolution in architecture.

Where roofs were of wood they continued to be flat on their under sides, being, of course, still formed of transverse beams; but they were carried not by posts or columns, but by arches; timber-roofed buildings therefore involved a mixed system.

But the thoroughness that was the vital characteristic of the Roman mind would not allow their builders to

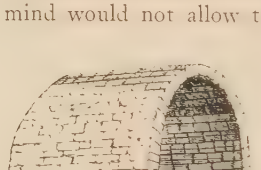


FIG. 6. BARREL VAULT

rest here. They had discovered how to support a roof without columns; they now proceeded to discover how the architrave and beams might be dispensed with and a building constructed on the arcuated system throughout. That is, they invented arched roofs of stone, called vaults.

The earliest form of vault followed inevitably upon the invention of the arch; in a sense every covering of a vertical opening—the head of a doorway or a window for instance—is a roof, and any archway, however narrow, is thus a vault. An arch of Magdalen Bridge, for example, is an arch as seen from without, but a vault to a person beneath it. It is obvious that when once an arch had been constructed, the idea of increasing its depth longitudinally

to form a roof would immediately follow. So was produced the first stone vault, known from its form as the tunnel or barrel vault. Examples of this type are found at all subsequent dates; in Oxford a barrel vault of the twelfth century roofs the slype of the Cathedral Cloisters, and another, of the Renaissance period, the kitchen of Wadham.

Any rectangular area could be roofed by this means, but there were two disadvantages involved; abutment was necessary along the whole length of the vault, neces-

FIG. 7. GROINED CROSS-VAULT

sitating very massive supporting walls; and all openings for doors and windows must be cut below the level of the springing of the vault.

Now, if, as often must have happened, one such vaulted area, as for instance a gallery or passage, was crossed by another at right angles, what complications would ensue? If we imagine two equal tunnels to interpenetrate, no part of either being omitted, the square formed by the crossing of their rectangular plans will be enclosed within four walls, blocking the passage-way, and will be roofed by parts of the two vaults above it. The intersection of these vaults forms diagonal arches called

groins, which spring from the corners of the square and are independent of the support of its walls; the drawing shows that if these walls and parts of the two vaults are removed, the square space will be roofed by four curved stone faces supported by the arches of the groins (Fig. 7).

The construction of this cross-vault, though difficult to explain in words, is perfectly simple to the eye when seen in a drawing or a model. A clear idea of it is essential to the appreciation of all later architecture, for its discovery by the Romans was the beginning of that system of the concentration of arch-thrusts which is the fundamental principle of Gothic building construction. When once it was discovered that a square space could be roofed by a groined vault, resting on the four angles only, it was seen that any rectangular area could be vaulted by dividing it into squares and roofing each with a cross-vault. The walls could then be omitted or reduced to mere screens, provided that piers were left at the corners of the squares to support the springing of the groins.

The Romans vaulted enormous areas with single cross-vaults; no later architects dared to emulate them. The early mediaeval workmen divided their spaces into squares, and roofed each with a small groined vault; but they learned to improve upon their model, as will presently be seen, and they devised a new and superior system. The Renaissance architects put back the hands of the clock and returned again to the simple groined form that had been improved out of existence. Examples of the revival of Roman cross-vaulting may be seen in the work of the eighteenth-century architects, in the cloisters of Queen's, All Souls, and Worcester Colleges.

The immense importance of this Roman legacy to posterity, the groined vault, will become more apparent

when we come to consider our Norman buildings: still more when we try to trace the progress of roof-making from the simple barrel vault of the Cathedral slype to the intricate mechanism of the vaulting of the choir—

> That arching roof,
> Self poised, and scooped into ten thousand cells
> Where light and shade repose, where music dwells
> Lingering and wandering on, as loath to die.

The groined vault was the germ from which the peoples of Western Europe developed the marvellous 'fretted vaults' which are the most characteristic feature of Gothic; this application of the arch was Rome's bequest to her western heirs. But so magnificent was her estate that she had an almost equal gift for the eastern nations; it was that noble form of arched roof that causes the Radcliffe Camera to dominate every view of Oxford and makes S. Paul's Cathedral seem to group all London around its mighty dome.

The dome, like the barrel vault, followed inevitably upon the discovery of the arch; its form is produced by the revolution of a semicircle upon its vertical axis. But though the Romans were the first builders of great domes, as they were of scientifically-buttressed arches, they were anticipated in the use of that form of roof by prehistoric man in Egypt, whose pit-dwellings were covered by domes of dried mud, and, ages earlier still, by the beavers, which roofed their circular lodges with domical vaults of twigs and clay.

The obvious application of the dome is to the roofing of a circular space; the Romans, having invented the form and applied it to round buildings, left it to their successors in the eastern empire to poise it upon the

angles of a square and abut it by lesser domes or barrel vaults, thus giving the Byzantine architects the chance to win immortality for their memories by their use and development of their Roman heritage.

In Oxford we have the dome as the Romans left it, for the Renaissance architects, to whom all our examples are due, of course copied the buildings of Rome. It is only in details that our English styles show Byzantine influence, and therefore, in a book of local architecture, we are not justified in tracing the development of a divergent branch; but to those interested in architecture as a whole—and to this state all must come who develop any real interest—the adaptations of the dome by the Byzantine architects will prove almost as interesting as the development of cross-vaulting by those of the Gothic races.

One other application of the arch remains to be considered, its use in the building of bridges. There had been great buildings before its invention, but there had been and there could be no great bridges. The influence of bridges upon civilization has been incalculable, and the use of the arch in carrying highways over rivers is probably the highest service its invention has rendered to the welfare of humanity.

CHAPTER III

ROMANESQUE ARCHITECTURE

Modern architecture, like modern history, begins where Roman ends, with the wave of barbarism that overwhelmed the empire. And like the history of modern civilization, its story is the tale of the reconstruction, under Christian influence, of the old ruins into a nobler

system than the ancient one. So great was the shock, that centuries passed before the arts began again to lift their heads, and during those Dark Ages Western Europe relapsed into timber construction. Only in the East, and especially in Byzantium, art and learning still survived. In Italy also there was a sort of continuity in architecture, the Christian barbarians building, or rather concocting, churches, by piecing together fragments of Roman buildings

In England the palaces of the kings, and the cathedrals of the bishops, were of such unsubstantial character that scarcely a vestige remains that may with certainty be ascribed to an earlier date than the eleventh century. Yet even in the Dark Ages, and in England, the darkest of European countries, the influence of Roman architecture was never without its witness. Monks returning from pilgrimage to Rome kept alive the tradition of stone buildings, and Bede records attempts to construct churches 'with stone and lime', 'after the Roman manner.' Traces of these early Saxon churches remain in the crypts of Ripon and Hexham, and nearer home at Wing, Barnack, and Brixworth—the last being possibly a reconstruction of a Roman basilica.

The history of Oxford begins in the eighth century, with the story of S. Frideswide, and one would like to believe that our architectural history begins there too, with the building of the church of her nunnery. In the east wall of what is now the Lady Chapel of the Cathedral are three round arches of rude workmanship that must certainly belong to an earlier building; and on the other side of the wall, in the Canons' Gardens, are buried the foundations of apses into which these arches opened. The workmanship of the arches is just what might be

expected from men making a rudimentary attempt to build on the Roman model, with no other guide than rough sketches and the oral instructions of some returned pilgrim. The stones are unhewn, merely the local rubble in lumps, just used as it came straight from the quarry, and their irregularities make thick beds of mortar necessary to fit them together. It is then not improbable that we have here the traces of an eighth-century church, and an example of the early rude attempts at the revival of Roman architecture such as are recorded by Bede.

But it was not until the genius of Charlemagne had reduced the chaos of the western empire into some sort of order that the nations had leisure and quiet enough to make any general attempt to evolve an architectural style. Then as the tumult and the shouting dies, white churches begin to be dotted over Germany and France, each fondly believed by its builders to represent the real Roman manner. The East has long ago developed for itself a Romanesque style of building, and now a western form of Romanesque architecture comes also into being. This, if it were possible at this time of day to correct the nomenclature of the Renaissance architects, is the true Gothic style—the building system evolved by the northern races of whom the Goths are representative.

In England its progress was slow, for hardly had Angle ceased to slaughter Saxon than Dane arrived to massacre both. Britain also was farthest removed from Rome, was the last part of the Empire to be civilized and the first to be abandoned to the barbarians, and so there remained but few Roman buildings to serve as models or as quarries of hewn stone. One would therefore expect to find few examples of stone buildings belonging to the Saxon period; the rude arches in the Cathedral are

FIG. 8. SAXON ARCH IN CATHEDRAL (*c.* 727, part restored)

all that remains of early Saxon Oxford except the great mound (*c.* 912) that formed the fortress of the citizens.

Churches there must have been; for though the first evidence of the existence of Oxford does not occur until the year 912, yet the entry in the Chronicle under that date shows that Oxford was already an important town and the military centre of the surrounding district. 'In this year died Æthered ealdorman of the Mercians and King Eadward took possession of London and of Oxford, and of all the lands that owed obedience thereto.' A town classed with London as a military centre must have had a considerable population and a corresponding number of churches. But of these not a vestige remains. Either they were of wood or else of such primitive masonry that they were contemptuously swept away by the Norman builders. Oxford in Saxon days, a border town now in Wessex, anon in Mercia, alternately burnt by either side and by the Danes when Wessex had permanently secured it, must have been a most unhappy city in which church-building was a matter not likely to be very much in the minds of the population. The Danes, who had no regard for the Sabbath, welcomed an opportunity of catching folk at their prayers and burning their church over their heads. Not until the eleventh century had Oxford people any reasonable certainty of undisturbed devotions.

Alien sovereigns have ever been blessings in disguise to England, and the accession of Canute not only gave peace to a harassed land, but brought its people into touch with European movements. So now, in the middle of the eleventh century, Romanesque architecture, hitherto represented only in a few favoured situations, spread over the country and left its mark on Oxford in the building of the tower of S. Michael's Church. A very

FIG. 9. THE CASTLE MOUND (*c.* 912)

FIG. 10. S. MICHAEL'S TOWER (*c.* 1071)

human wish to associate a piece of work with a name has caused the tower to be attributed to Robert d'Oilgi. There is no evidence either way, and it is quite immaterial whether the tower was built shortly before or shortly after the Conquest. What is certain is that it exhibits all the characteristics of buildings erected by the English before the influence of the more skilful Norman masons had affected the native craftsmen. For a generation after the Conquest the Normans must have been too busy with military matters to think of church architecture, and such churches as were built must have been constructed by native workmen very much in the pre-Conquest manner.

An entry in Domesday Book states that the 'Priests of S. Michael' had two mansions in Oxford at the date of the survey; the Chronicle of Abingdon Abbey records that Robert D'Oilgi restored churches both within and without Oxford; and the Oseney Chronicle says that he built S. George's Church in the Castle and endowed it with lands for the support of its priests. That is all the documentary evidence, and all it proves is that D'Oilgi was a church-builder, and that S. Michael's Church existed in his day. The latter fact is also proved by the architecture of the tower; and one detail, the moulding of the impost stones of its belfry windows, suggests that one of his Norman masons may have taken part in building or restoring it.

The rest of the church shows a mixture of the work of different dates in which no details are earlier than the thirteenth century. Judging by the lancet windows of the east end, this is the date of the present chancel; there is, however, one very remarkable feature which affords some reason for thinking that the walls, in spite

of their thirteenth-century windows, may be those of the original building: their great height compared with the narrowness of the chancel is without parallel in the district; but any one that has seen the Saxon churches at Bradford-on-Avon and Jarrow will at once be struck by the strong similarity between their high and narrow structure and that of S. Michael's chancel.

With the astonishing aptitude for civilization that distinguished them, the Normans had eagerly taken part in the revival of architecture, and at the date of the Conquest were developing in their duchy a local school of Romanesque, known as the Norman style. Its influence on English building is first seen at Westminster in the work of Norman masons imported by the Confessor. At this time Norman architecture differed from Saxon mainly in being on a grander scale, but, transplanted into England, it developed with extraordinary vigour in the century following the death of the Conqueror, and, unlike every other style in history, it knew no decline, and only ceased to exist because it lost its identity by its very growth, as the larva ceases to be a grub by becoming a dragon-fly.

For this reason one ought to judge carefully whether the Norman, or indeed the western Romanesque style as a whole (for Norman is but the most fruitful branch of the western Romanesque tree), is to be considered as a separate style. In the chapter on roof-making I have followed Ruskin in admitting three possible architectural systems, distinguished by the use of the lintel, the round-arched and the pointed vault; but there is such affinity between the two last that it might be asserted that there are only two great architectural styles, the trabeated system of the ancients and the arcuated system of the

FIG. 11. IFFLEY CHURCH, WEST FRONT (*c.* 1160)

moderns.[1] Then Romanesque and Gothic must be regarded as stages of growth in a great arcuated system invented by the Romans and perfected by the mediaeval builders, and for which a name has yet to be invented.

Englishmen of Norman days saw greater activity and progress in building than has been seen before or since on the face of the earth. The genius of that extraordinary race has its witness in the architecture of three-quarters of the ancient churches of the country. Buildings that they planned for mere monastic churches serve to-day as cathedrals for great bishoprics, some, like our own Cathedral, shorn of their original dimensions. Village churches, such as Iffley, still suffice for the needs of the district, though built when the population of the whole Norman dominions was less than that of modern London.

In Oxford evidence of this astonishing energy may be found in the tower, the crypt, and well-chamber of the Castle, and the chancel arch of Holywell, all attributed without improbability to the d'Oilgis, in the chancel and crypt of S. Peter's and the whole of its south wall, including the doorway, in the doorway of the Cathedral Chapter House, and in the adjoining slype, in the remains of a doorway at S. Ebbe's, in the basement courses of S. Mary Magdalene tower, in the lately discovered crypt in Frewin Court, and in the nave, choir, and transepts of the Cathedral, which is the last important building in England that can be said to belong to the Norman style. These relics still remain to tell of building and rebuilding in Norman times; but they represent only a fraction of the results of Norman activity in Oxford; the Chapter House doorway implies a complete building;

[1] The mixed system of our own day is, of course, a hybrid and no true style.

FIG. 12. THE CASTLE AND MILL

so with the other features. And in addition we have documentary evidence of the building of a complete monastery, Osney, with a church larger than the present Cathedral.

It was not only in church-building and in fortification that the Normans proved themselves the instruments of civilization; the greatest of d'Oilgi's architectural achievements in Oxford was the building of his two bridges across the Thames, the Grand Pont[1] and the Hythe Bridge. Both have been rebuilt more than once, but of his bridge over the Cherwell at Heyford some parts are original to-day.

All through the Romanesque period successive generations of builders were working out the problems of arch construction that had already been solved by the Romans. Their great ambition was to construct a church all of stone from floor to ceiling, but the difficulty of vaulting the nave by means of round arches alone baffled them until the last. They could arch the heads of doors and windows and construct barrel vaults and semi-domes; later on they successfully attempted the cross-vault in the roofing of aisles and chancels; but at Durham alone the nave was vaulted by this means. Elsewhere the solution was not reached until the search for it had brought about so many developments and modifications that the Norman style was transformed out of existence. So in our own Cathedral the Norman builders covered the aisles with stone vaults, but did not venture to arch the ceilings of the nave or the choir. That they hoped to be able to do so eventually is shown by the shafts they built to carry the vault-arches, which shafts were actually used for that purpose when the choir-vault was con-

[1] This is uncertain, but not improbable.

structed in the fifteenth century. But the nave, like most Norman naves, remains incomplete to this day, being still covered by a timber roof.

The progress of architecture through the twelfth century is almost entirely due to the efforts of the architects to construct a completely vaulted building; and it was the achievement of their ambition that brought the Romanesque style to an end, and in so doing brought into being the system known to us as Gothic architecture.

My purpose in this part of the book being only to sketch briefly the history of the successive styles, I shall defer to the second part a detailed description of each; the reader will already have understood that the use of one or other of the ancient Orders marks a building in the Classic style, that a building with round arches, without columns and entablature, is usually of Romanesque architecture, and that the pointed arch is the most easily recognized characteristic of Gothic.

CHAPTER IV

GOTHIC ARCHITECTURE

The difficulty of constructing a cross-vault over the oblong bays of the nave by means of round arches led, in the Late Norman period, to the introduction of the pointed arch. It was then found that by using arches of varying span, all rising to the same level, it was possible to support a vault upon many small arches instead of upon the two diagonals of a cross-vault. The result was not only the simplification of vaulting problems, but the discovery of a system of concentrating the thrusts of the roof-arches at a few points where the resultant of their forces could be received by a solid mass of masonry.

The Norman plan, like the Roman, had been to ensure stability by making the walls and piers so massive that their weight was sufficient to resist the thrusts exerted at any point. But this, except in the building of barrel vaults, involved a great waste of material, since the thrusts of a cross-vault are received at four points only (Fig. 7); neither the Roman nor the Norman builder fully realized that at these points alone was abutment needed.

This was the great conception of the Gothic architects, and the central principle of their system is less the use of pointed arches than the economizing of material by the skilful distribution of masses at the points where arch-thrusts were concentrated and by the disposition of arches so that the thrust of one was met and annihilated by that of another. This principle, which will be illustrated fully in another chapter, was conceived in the latter part of the twelfth century, and was worked out through the three centuries following. Its development was a joint enterprise common to the architects of Western Europe; an advance in one country was almost as quickly taken advantage of in the others as an improvement in battleship construction in our own day.

The new system, unhappily named Gothic by the Renaissance architects, was, still more unhappily, divided into three styles by the nineteenth-century Gothic revivalists. When Rickman, the earliest of them, came to examine the characteristics of the system he, like the pioneers in every science, classified his subject according to details, without appreciating the principles that underlay them. Observing that the superficial character of buildings of the thirteenth century differed considerably from those of the fourteenth, and these again from those of the fifteenth, he classified the thirteenth-

century work as Early English, that of the fourteenth as Decorated, from the more ornate character of its detail, and that of the fifteenth as Perpendicular, from the prevalence of the right angle in its window-tracery and panelling. But in truth, there are no more three styles in Gothic architecture than there are three persons in one individual. What he mistook for styles are stages of development. These names, however, like the unfortunate word Gothic, are now fully established, and it seems hopeless to try to abolish them. But they are certainly misleading, and they are incomplete even as representing stages of development, so that 'transition' styles have been invented to describe the work of the end of the thirteenth and fourteenth centuries. This is to make confusion worse confounded, for it is to assert definite periods of transition while the essential truth about Gothic architecture is that it was in transition, i. e. developing, throughout the whole of its existence. It is, of course, possible to distinguish broad stages in the growth of Gothic as in that of a human organism; an alternative to Rickman's classification is that of Sharpe, who recognizes the following periods:

Lancet, 1180–1245: example—Cathedral Chapter House, 1220.
Geometric, 1245–1315: example—Merton Chapel, 1297.
Curvilinear, 1315–60: example Latin Chapel, 1350.
Rectilinear, 1360–1550: example—Divinity School, 1450.

But these, though more complete than Rickman's divisions, are based, like his, upon superficial characteristics; and they are even less descriptive, because they refer merely to one conspicuous feature—the window. They are no

more a scientific division of stages than Shakespeare's picturesque *Seven Ages of Man* is descriptive of the organic growth of the individual man. A really logical distinction of the periods of Gothic architecture would be based upon the progressive changes in vault construction and buttressing, to which modifications in other features can usually be traced.

It may be objected that the great majority of Gothic buildings are not vaulted at all. The answer is that they are not representative Gothic, but only buildings with Gothic details. Gothic construction was worked out in the great monastic architectural schools, and its details were copied in the parish churches whether they were structurally necessary or not. The parish churches *reflect* the progress of Gothic, but they do little to *explain* it.

A description of Gothic architecture can be illustrated by the details of almost any ancient church, but the morphology of those details can only be properly understood from an examination of a vaulted building. Few students in these days will be content to know merely the forms by which the work of different periods is characterized; in the study of architecture, as in that of science, to know the forms of things is only to ask how those forms are adapted to their purpose, and by what stages they reached their existing shapes.

The pointed arch, which had been found essential in the vaulting, was soon discovered to be graceful and convenient for use in the other parts of the building. At first the architects used the new form only where it was structurally more suitable, but its beauty, and perhaps the desire for consistency, soon led to the almost total exclusion of the semicircular arch.

We have in our own Cathedral a building that illustrates

FIG. 13. INTERIOR OF CATHEDRAL

as well as any in England the passing of Romanesque architecture into Gothic. The chancel was begun in 1160, and the west end of the nave was finished in 1180. Richard I, who lived as a child in Beaumont Palace, may well have been taken to see the builders at work upon the new church of S. Frideswide. If he had spent his boyhood's years in Oxford he might have seen the gradual change of character and method that marked the slow progress of the work. East of the tower every arch is semicircular, the piers are ponderous, and the vault-ribs plain and massive; but in the nave, though the main arches are round, the heads of the windows above are pointed, and so are the arches of the aisle-vaults, the piers are less massive, and the vaulting-ribs are light and thin, and their surface is relieved by grooves and ridges (mouldings) carved in the stone.

The workmen that finished the west end of the Cathedral may have found work awaiting them in the building of S. Giles's Church. There is very little at S. Giles's that is later than the middle of the thirteenth century, and the tower-arches and south aisle belong at the latest to the earliest years of that century. The wall of that aisle is still thick and massive, for it has but two small buttresses at its angles; its windows, set singly in the wall, have the long thin shape that marks the Lancet or Early English stage of Gothic; and on the contemporary font may be seen the 'dog-tooth', which is the characteristic ornament of the style. The builders of the north aisle may have discussed the judgement of heaven upon John as they sat at their midday meal. The lancet windows are now grouped together in twos and threes, and the work is much lighter than before. The walls are well buttressed, and are therefore thinner than the northern one.

FIG. 14. S. GILES'S CHURCH, THIRTEENTH CENTURY

By far the finest example of Early Gothic in Oxford is the Chapter House of S. Frideswide, built about 1220. Six pointed arches carry the vaulted roof of each of its bays; it has single lancet windows in its side walls and a group of five at its east end; the deeply-cut mouldings that ornament their arched heads, and the foliage that is cut upon the caps of their shafts are admirably typical of the best work of their date. The contemporary Lady Chapel of the Cathedral is also a fine example of the Lancet or Early English stage of the style.

Of its next stage, the Decorated, in which it reached its highest beauty, we have one of the most beautiful examples in the choir of Merton Chapel, built in the last years of the thirteenth century. Unfortunately it is not vaulted, and to examine the development of vaulting science we must go to the Latin Chapel of the Cathedral, half a century later in date; but in its windows and its carved ornament it shows as well as any building in England the perfection of Gothic art. The Lancet stage is definitely left behind, and instead of separate lancet-shaped piercings of the walls, the various openings are all formed by means of a framework of stone bars inserted in a single large arch; the lights are lancet-shaped still, but they form only a minor part of the composition; it is the design above them that is the conspicuous feature in the windows of this period, the tracery of circles and trefoils, curved triangles, and other geometrical forms, that fills the arched head of the window with beautifully shaped openings for the admission of light.

In the canopies of the stone seats near the altar, and in the carved foliage of the contemporary shrine of S. Frideswide in the Cathedral, we have some of the loveliest examples of mediaeval art. For the first time in

FIG. 15. THE CHAPEL, MERTON COLLEGE (*c.* 1297)

FIG. 16. THE CLOISTERS, NEW COLLEGE (*c.* 1386)

the history of architecture the beauty of natural leafage is faithfully reproduced in the decoration of buildings. But this period is all too short; S. Mary's spire (*c.* 1300) is its highest achievement; then Gothic art begins its slow decline, though Gothic science is progressive to the end. The artistic beauties of the style belong to its early stages; its mechanical triumphs to its later years.

Of the century between the dates of Merton and New College we have few buildings remaining. The windows of the south aisle of S. Mary Magdalene, of the north aisle of S. Peter's, and of the Latin Chapel in the Cathedral, all belonging to the first half of the fourteenth century, show in their tracery the wavy lines of the 'Curvilinear' or late Decorated period. The buttresses of these buildings, with their increased projection and the concomitant thinness of walls, are also representative of their date. But we have no piers or doorways of the mid-Gothic period, and our only fourteenth-century vault[1] is that of the Latin Chapel. It is not so elaborate as many others of its date, but it will serve to show the progress of vaulting in the century following the building of the adjacent Lady Chapel.

The Black Death put a check on the development of architecture for nearly a generation. In 1380 William of Wykeham began his 'new' college, and adopted a new form of window-tracery which had been invented at Gloucester. In these windows the stone bars between the lights are carried up from the sill to the arch, thus giving support to the latter, and allowing it to be made wider. But mullions of such a length require lateral stays, and so transoms, or cross-bars of stone, were carried

[1] Except the plain vaults in the basement of the Old Convocation House (*c.* 1320) and in the passage-way to the Mob Quad at Merton.

horizontally across the window from jamb to jamb. It was these great windows, with their numerous oblongs formed by crossing mullions and transoms, that suggested to Rickman the term Perpendicular to describe the fifteenth-century stage of Gothic. The rectangular forms in the windows are repeated in the panels cut in the face of the walls; these, though they offend artistically by repeating a single form, are an evidence that the great Gothic principle of economy in material was never better applied than in the last stage of the style; a panelled wall is as efficient as a blank one, and requires less stone. But it is in the vaulted roofs of the fifteenth century that the triumph of Gothic science is most clearly seen. The vault of the Divinity School, for example, is a mechanical marvel; it is supported by means of buttresses alone, the walls between them being practically sheets of glass. And even in the buttresses, great as they are, not a pound of weight is wasted; the outward thrust of the vault-arches within is so nicely calculated that the mass of the buttress is just sufficient to ensure the stability of the building; its form also, thin and deep, shows the consummate skill with which the fifteenth-century builders distributed the abutment of their arches. The very pinnacles that strike the eye as mere ornaments contribute their part to the stability of the building by weighting the buttress against the outward thrusts of the arches within.

The architecture of the century following the Reformation is usually described as debased Gothic, and is regarded as the final stage of a gradual process of degeneration that began early in the fifteenth century; from this point of view the revival of the Classic Orders was an attempt to replace a decadent style by a new and vigorous system.

That there were signs of degeneracy in fifteenth-

FIG. 17. THE DIVINITY SCHOOL (*c.* 1450)

century architecture cannot be denied; a failing sense of beauty is seen in the carved foliage, a lack of restraint and lower ideals in the profusion of easily executed details, and a stinting of design in the repetition of similar forms. And it is significant that the ornamental details of the Classic Orders were revived long before their structural principles, as if the builders sought to retain Gothic construction while abandoning its debased ornament.

In spite of this a good deal might be said to show that sixteenth-century Gothic was not a debased style, that the revival of Classic architecture was the cause and not the result of its downfall, and that but for that revival our cities to-day would be as beautiful as in the Middle Ages.

Even in Tudor times some of our finest examples of Gothic were still being designed; the present nave and choir of S. Mary's and the bell-tower of Magdalen—the finest tower of the Middle Ages—were built in the last years of the fifteenth century, while Christ Church Hall is more than a quarter of a century later. These are no more debased architecture than is New College. And that even the seventeenth century could produce Gothic work worthy to set beside these may be seen in Christ Church stairway and Wadham Chapel.

It may be said that these are isolated examples and that the vast majority of Elizabethan and Jacobean buildings have the lintelled windows and depressed door-arches that are understood to be the marks of debased Gothic. It is true that the Fellows' Buildings at Merton have not the traceried windows, the shafted doorways and exquisite carved foliage of the Chapel; but this is no evidence that they are a debasement of the earlier style. They are rather to be regarded as an attempt to modify the details of mediaeval architecture to meet the building

Fig. 18. Vault of Divinity School

requirements of a later age. With the new notions of the Renaissance came new needs; the simple plan of the church nave that had served for the early manor-house could serve no longer; far more complicated planning was now necessary. With the Reformation, too, art ceased to be exclusively associated with religion; no more churches were needed, and monastic building came to an end. It was inevitable that, with the development of civilization, ecclesiastical and domestic buildings should diverge more and more from a common type; but it is surely wrong to brand the newer variation as a debased form.

The abandonment of the pointed arch is generally regarded as the proof and sign of degeneration. This idea is due to the mistaken belief that the pointed arch is the fundamental characteristic of Gothic architecture. A vaulted space ought always to be lighted by windows corresponding in form to the arches of the vault, but in unvaulted buildings this necessity does not exist, and so square-headed openings are not uncommon even in the finest period of the style. In the small windows of domestic buildings they are the most obvious and convenient form. That they need not necessarily be merely utilitarian every Jacobean manor-house proves. It is when they are inserted in the walls of ancient churches that they appear debased. But after the shock of the Reformation had passed, the builders appreciated this, and in the chapels of Wadham, Oriel, University, and Lincoln, as well as in those of Balliol and Exeter, which have since been rebuilt, they attempted to revive the tracery of the mediaeval window. That the results were less beautiful than mediaeval work was an inevitable effect of the Reformation.

The tower of Yarnton Church (1611) and the Chapel

Fig. 19. The Quadrangle, Oriel College (1637)

of Water Eaton (1600), if compared with the adjoining manor-houses, will also serve to illustrate the seventeenth-century attempt to adapt Gothic architecture alike to domestic and ecclesiastical needs.

When, in the Middle Ages, the church window was the house window, the men who lived in houses worthy of the name were no more numerous than the churches. A more democratic age could not build church windows in all its dwellings, and would not continue to build them in a few. It therefore evolved a modified form for domestic buildings, which should not challenge comparison with the house of God, which was adapted both to manor-house and cottage, and was convenient and beautiful in either. In spite of all that has been written about debased Gothic, I think that the last phase was a natural development and not a debasement of the style. The Renaissance of Classic literature brought into contempt the building styles of the Middle Ages no less than the writings of the Schoolmen, even though they had not merited it; the downfall of Gothic architecture was brought about, not by the slow process of degeneration, but by a blind enthusiasm for everything Classic. Now, after three centuries of arrogant and ugly buildings, we are beginning again where the Elizabethans left off.

CHAPTER V

THE RENAISSANCE AND AFTER

In the sixteenth century, Rome was the Mecca of scholars. It was natural that the interest in Classical literature should extend to architecture, and, perhaps, equally natural that the mediaeval systems should fall into

FIG. 20. THE QUADRANGLE, S. JOHN'S COLLEGE (*c.* 1630)

contempt. In Italy itself, where Gothic had always been an exotic, the style was early abandoned, and the writings of Vitruvius became the gospel of a new school—named the Palladian, after Palladio, its leading apostle.

This Italian school was afterwards to provide models for the western countries; but at first the nations by whom Gothic was invented, seemed loath to abandon it completely; perhaps it was the architects and not the wish that was lacking. Native craftsmen built the Chapel of Henry VII at Westminster, but an Italian architect was employed to design his tomb; it was not until a supply of English architects, trained abroad, was available that large buildings were designed in the new style; until the middle of the seventeenth century buildings were still Gothic, except that a doorway, a chimney-piece, or a porch, might be added by an Italian craftsman. Among our earliest examples of the mixture of styles are Anthony Forster's tomb at Cumnor, and Bishop Jewel's porch at Sunningwell. By the end of the sixteenth century there were Classic details in every building, but where it was purely the work of native craftsmen they were not sufficient to un-Gothicize the effect. Thus Wadham College, built by Somersetshire masons, has a far more Gothic appearance than the back quadrangle of S. John's, which was designed by Inigo Jones only a few years later.

Inigo Jones (1573–1652) was the first great English architect to break definitely with the older traditions. He had studied abroad the architecture of the Italian Renaissance, and on his return to England was commissioned by James I to build his new palace of White Hall. His design, which was never completed, has no Gothic features; it is purely Classic, like his Gateway to the Botanical Gardens (1633). His work marks the

FIG. 21. CLARENDON, SHELDONIAN, AND OLD ASHMOLEAN BUILDINGS

final break with the system of the Middle Ages, not alone with the building style, but with the conditions under which the work was carried out. Wykeham or Merton had been content to lay down the general plan of his buildings, leaving the form of minor details to the individual workman—the grotesques in the cornice of Merton Chapel, for example, were obviously designed by the man that cut them and not by Merton or his master builder; but the new school of architects, like the ancients they copied, worked out the complete design on paper, down to the minutest details, and left the workman no responsibility but that of accurately copying them. To Inigo Jones succeeded Sir Christopher Wren, of whom it might be said in Broad Street as truly as in S. Paul's, *si monumentum requiris circumspice*. The Chapel of Brasenose College (1656) is sometimes attributed to Wren, who was a fellow of All Souls at that date. But it is hardly probable that an architect with his knowledge of principles would have designed such a mixture of Classic and Gothic details. It was his work in Oxford that put a definite end to the lingering Gothic and inaugurated a period of unmixed Classic architecture. Unmixed, that is, with any Gothic features; but the buildings of Wren, like those of Palladio, are a return to that anomalous system which prevailed when the Roman architects of the first century were seeking to combine the forms of the Classic Orders with the principles of arcuated construction. So in the front of the Sheldonian Theatre (1666) Wren supports a Corinthian entablature by means of arches, and disguises their abutment in the form of columns that appear to be carrying the weight. His finest work in Oxford is the Chapel of Queen's College, especially interesting for its revival of the Roman apse

FIG. 22. ALL SAINTS' CHURCH (*c.* 1709)

in its chancel. Wren was also the first English architect to revive the Roman dome. His earliest experiment, the little dome of the Sheldonian Theatre,[1] is the small sister of his mighty one at S. Paul's, and the beautiful one of Christ Church.

But it is not merely by his own buildings that Wren left his mark on Oxford; his influence is seen in the work of other architects, in the front quadrangle of Queen's College and the back quadrangle of All Souls, built by his pupil Hawksmoor, in the Chapel of Trinity, designed by Dean Aldrich, and in the great dome of the Radcliffe, built by Gibbs in 1750. Dean Aldrich of Christ Church represents a new type of architect, the amateur, made possible by the new condition that the directing mind need not be that of a craftsman. The most famous of the amateurs was Sir John Vanbrugh—

> Lie heavy on him earth, for he
> Laid many a heavy load on thee.

Perhaps the heaviest, in proportion to its area, is the Clarendon Building, built in 1709; but Blenheim Palace is his best known work—and perhaps his ugliest. Dean Aldrich designed Peckwater Quad at Christ Church, and is credited with the design of All Saints' Church, 1710. The great interest of the building is in its spire, an essentially Gothic feature grafted on to a Classic base. The spire, which was the one Gothic structure built solely for display, was naturally the one retained by the architects whose models were the costly and magnificent buildings of imperial Rome. Wren's London spires are, of course, known to every one; few are so near to the mediaeval form as the spire of All Saints'. It is as if Gothic

[1] Much modified in 1838.

struggled in its grave. The principle of verticality, indeed, never ceased to struggle in Oxford; it sprang up again in Hawksmoor's towers at All Souls—perhaps the influence of the old Gothic surroundings was too strong to be resisted; certainly that influence must have been felt as a disturbing force by eighteenth-century architects in Oxford. When the New Buildings were added to Magdalen in 1733, it was proposed to pull down all the Gothic work and rebuild the college in harmony with the new block. Fortunately lack of funds caused the design to remain upon paper.

So for two centuries and a half the Classic style prevailed in Oxford, and, of course, throughout Western Europe (the garden quadrangles of New College (1684) and Trinity (1665), suggested by the plan of the new palace of Versailles, serve to remind us that the Classic revival was common to civilized Europe). The ancient Orders had been welcomed with enthusiasm, but from the first it might have been foretold that they could not satisfy the architectural needs of a modern nation. The true Renaissance of architecture was in the twelfth century, when the western peoples took the arcuated system of Rome and developed from it the glorious Gothic style; the sixteenth-century architectural Renaissance was a false one; the real Renaissance of that date was literary; and the birth of literature and architecture can never coincide in time; architecture is the earliest, literature the latest, of the arts.

Classic architecture became the symbol of plutocracy. It was essentially a style for the great and the rich; it could not condescend to the resources of the local quarries; its massive lintels and its columns must be fetched from afar; its associations demanded scholarship in the

architect, and its refinements and symmetry demanded exceptional skill in the craftsman; moreover, the price to be paid for it was the utter subordination of the individual workman. When its conditions cannot be granted, when its price cannot be paid, it becomes a mockery like the dwarf columns in the fronts of houses near Queen's College.

Before the end of the century it had become a pompous absurdity, in the dull, heavy inanity of Worcester College, for example, or in Wyatt's Gateway to Canterbury Quad. Early in the nineteenth century its imbecility became too obvious to be longer tolerated; and it was 'put away'.

CHAPTER VI

THE GOTHIC REVIVAL

The Classic style had been tried and found wanting. It had no affinity with the ideas of a modern people, and it was not adaptable to modern needs; it forced the architect to sacrifice comfort and convenience for the sake of appearance; as Pope said of Blenheim Palace:

> 'Tis mighty fine;
> But where d'ye sleep and where d'ye dine?
> I find from all you have been telling
> That 'tis a *house* but not a *dwelling*.

Disciples of the Oxford Movement denounced the style as Pagan, and preached a return to the architecture of the ages of faith. It certainly was an essentially un-Christian style, not because it was the style of the heathen temples, but because it enslaved the workman, and was

purse-proud and arrogant. But the Gothic revivalists fell into the error of the Renaissance architects; led by blind enthusiasm, they began to reproduce Gothic buildings as if the architecture of the thirteenth century

FIG. 23. SEVENTEENTH-CENTURY HOUSE, BALLIOL COLLEGE

could satisfy the needs of the nineteenth. The originators of the great building styles, of Egypt, of Greece, of Rome, and of Mediaeval Europe, had evolved them, not by copying, but by taking the principles of older work and applying them to their own newer needs and circumstances. In no other way can a worthy style of architecture be produced.

The nineteenth century, with its enormous increase in wealth and population, with its Reform Bills and Education Acts, saw conditions utterly different from any previously existing. What it urgently required was a system of domestic architecture suited to the physical and spiritual needs of a modern democratic nation. Such a system, of course, had never been evolved, and could not be copied.

In the Middle Ages the vast majority of domestic buildings had been made of timber—a framework of posts and beams with the interstices filled in with wattle and daub, or with laths covered with plastered clay. In the villages near Oxford many a ruined cottage can be seen with the laths or wattle exposed where the clay has broken away; and many more timber-framed houses are still inhabited, but bricks have been substituted for the original plaster. Bishop King's Palace and the old house behind the west front of Balliol are fine examples of the timber-framed houses of Elizabeth.

With the rise of a yeoman class, with the growth of wealth and population, with the dissemination of learning, there grew up in later Tudor times a general desire for more substantial and comfortable dwellings. It ill becomes the present utilitarian age to condemn Jacobean builders for admitting that houses could no longer be built in the style of churches, and for modifying Gothic forms to suit purely material needs; it was still more absurd for the Early Victorians to brand their work as debased. Nevertheless, the cry was for Gothic, the whole Gothic, and nothing but Gothic, in church, chapel, gaol, county court, school, and city dwelling. Practically the only models were the mediaeval churches, and the architects

FIG. 24. BISHOP KING'S PALACE (built, *c.* 1540; restored, 1628)

tried to answer the demand by putting church doorways and windows into all their buildings, as if pointed arches to the openings could make a building Gothic. In churches the mediaeval style might seem as suitable now as in the past; like needs produce like results; faiths and dogmas change slowly, and the members of Exeter College may reasonably worship in the twentieth century in a replica of a chapel built in Paris in the thirteenth. Yet even to copy a Gothic church is to ignore the fact of the Reformation; a mediaeval church was not planned for congregational worship—it was a congeries of chapels and chantries, each with its own altar, each divided from the others. A modern church should be a single great auditorium; it is futile to attempt to revive the spirit of the Middle Ages (even if it were desirable) by reverting to its type of church-building. The numerous piers of an ancient church exist, not because the builders desired to obstruct sound and sight, but because they could not roof the building without them. Modern architects have no such excuse; in using them they are but copying the weakness of a more primitive style. S. Paul's Church, ugly as it is, is a more intelligent attempt to meet modern needs than any of the Gothic imitations of North Oxford.

Still, the mediaeval revivalists had their way. In 1826 S. Clement's Church was rebuilt on a new site in a style contemporary with the First Crusade; twenty years later the County Gaol was built in the same style. A few people understood that architecture was still on the wrong road, and in 1846 Cockerell built the Taylorian Buildings in the pure Ionic style, apparently in the belief that the failure of the Renaissance work had been due to the imitation of Roman corruptions. Pure or corrupt,

FIG. 25. EXETER COLLEGE CHAPEL (illustrating Early French Gothic)

the Classic Orders in architecture, like the 40*s.* franchise in politics and the heroic couplet in poetry, seemed far too narrow a means of expression.

But since mankind is only happy in chains and freedom is merely the liberty to exchange one bondage for another, the forms of Gothic soon became as sacrosanct as those of the borders.

Sir Gilbert Scott was the master-craftsman of the revival, and Ruskin was its chief apostle. Scott's first work in Oxford (1841) was the Martyrs' Memorial, in the style of the Eleanor Crosses (1294), and the north aisle of St. Mary Magdalene rebuilt to correspond. Then (1854) he built the Broad Street front of Exeter College, of which the kindest thing that can be said is that it is not as unhappy as his Holywell front of New College (1876). In 1856 he blew up with gunpowder—so good was the masonry that nothing less would serve—the seventeenth-century chapel of Exeter in order to rebuild it in the pure Gothic of the Sainte Chapelle. This example was immediately followed at Balliol, where Mr. Butterfield destroyed the sixteenth-century chapel to build the present one. But the greatest sacrifice to Gothicism was made when he cut down Merton Grove to put up the 'new buildings' (1864). Mr. Butterfield's best-known work is Keble College (1870). Like Sir Gilbert Scott, he found his models mainly in the thirteenth century churches. Mr. Waterhouse, who rebuilt the front of Balliol (1869) in the style of Carnarvon Castle, was one of the first architects to remember that Gothic was not a purely ecclesiastical system. Meanwhile Ruskin had discovered Venice, and inspired by him, Messrs. Woodward and Deane built the University Museum (1860) in Venetian Gothic. Other architects had their pet styles to reproduce; the church

Fig. 26. New Examination Schools

of S. Peter le Bailey was rebuilt on a new site in a style contemporary with Edward III; and that of Holy Trinity in the Lancet style of the early thirteenth century. The architect of S. Barnabas Church, Sir A. Blomfield (1869), more logical than the Gothicists, decided that if ancient types were to be reproduced, the most suitable was the basilican church of the early Christians, which he therefore proceeded to copy. Later in the century Mr. Bodley added S. Swithin's Buildings to Magdalen, making the first attempt at applying Gothic principles to modern conditions instead of merely copying Gothic details; these buildings are therefore among the most successful in modern Oxford.

But the architect whose name will be known to posterity as the representative of the builders of our day is Mr. T. G. Jackson. Mr. Bodley seems to have been the first to realize that a domestic type of architecture was the chief need of his day, and since the only domestic type of Gothic was the Jacobean manor-house, he reverted to that in building (1879) the Master's Lodge at University College, 'perhaps the most beautiful modern house in Oxford'. Mr. Jackson followed his lead, and has sought inspiration from the same source. His great work is the new Examination Schools; other examples of buildings in the same style are his quadrangle at Trinity College with the President's House (1887), his new buildings at Hertford and Merton, and the Library of the University Museum; the Town Hall by Mr. Hare, and the Indian Institute by Mr. Champneys.

The church builders still continue to imitate the mediaeval styles—or rather to reproduce their details. The poverty of churchmen compels them to build in brick, but instead of attempting to discover how to evolve

a really architectural style of using that material, they face their buildings with a skin of stone, which looks just as well and costs half as much as if stone had been employed throughout in the ancient manner. Thus we have lately seen the building of two 'Norman' churches in brick, S. Andrew's and the new Roman Catholic Church, one disguised with rubble the other with flint. In order to give greater verisimilitude S. Andrew's has been provided with a sham vault of plaster.

Meanwhile the original problem of modern architecture remains unsolved: what style of domestic building has been evolved to meet the needs of a great, educated, democratic people? The houses of East Oxford supply an answer. What will posterity think of it, what deductions draw from it? I have in mind a row of ten houses on a main road. They form a block of forty pigeon-holes under a single roof; four pigeon-holes accommodate a family; the oblong front of the block is pierced by forty oblong openings for doors and windows: there is the complete plan and elevation of dozens of house-blocks representing no more design than is required to build a rabbit-hutch.

To be happy in a dog-kennel one must be either a dog or Diogenes; and Diogenes was already a philosopher when he took up his residence in a barrel, or he would never have become one. Children brought up in mean streets of dull house-fronts have but a poor chance of developing that love for the beautiful which, more than any other attribute, distinguishes men from beasts.

Conclusion

Architecture has been too long the plaything of the antiquarian. It is time that it was recognized as a matter

of vital concern for every citizen; mere building is so recognized, and every house, nay, every piggery, has to be constructed in accordance with the conditions necessary for man's physical wellbeing. But what building by-laws recognize the existence of a spiritual instinct in man that craves for beauty and dignity in human surroundings? Yet it is by virtue of that instinct that man is man; if it is starved or stultified he descends again to the level of the brutes from which he sprang. Where there is no vision the people perish.

Only a great revival of art can save the modern nations from degenerating through specialization and materialism into communities of ants, and that revival can best begin in architecture, the first, the most necessary, and the most universal of the arts. If the average man had only as much knowledge of the principles of architecture as he has of sanitation, if he only realized that ugliness is as pernicious to the mind as stinks to the body, our cities might soon become as beautiful as they are healthy; an ugly building would no more be tolerated than an insanitary one.

Every building raised becomes a part of the public environment; and though its owner may make it a pleasant dwelling for himself, he owes it to society to make it also a pleasant object to his neighbours. That is the price he must pay for his alteration in the landscape. He has no more right to offend the public eye than he has to endanger the public health.

'You cannot make men artistic by Act of Parliament:' 'Man is born of woman, not of the Local Government Board.' As usual, truth is sacrificed to an epigram. Man is born of woman, but he is developed by his environment, over which society can, and to some extent does, exert

control. Are we, who have produced more great poets than any other nation, so oblivious of their teaching that we have no realization of the educational importance of beautiful things? Architecture, especially in towns, is a very dominant part of environment; if it is honest, beautiful, and dignified, it must have a like effect upon the minds of those brought up amongst it; if it reflects selfishness, cheap ostentation, and bad taste, it must leave like impressions on plastic minds. The indifference of the public to such a matter of universal concern is as lamentable as it is astonishing.

There are, it is true, some signs that the sun of art which went down into the black night of materialism a hundred years ago may shine again upon a later generation: we have garden suburbs, we are learning to preserve our ancient buildings, and we are asking for picturesqueness in our suburban villas. But we lack knowledge of architectural principles to criticize our architects, to encourage the good and send the bad out of business. In North Oxford there are hundreds of modern houses fondly believed by their occupiers to be 'half-timbered' like the timber-framed houses of the sixteenth century. Really they are ordinary brick houses with boards nailed to their fronts, having only the sham picturesqueness of stage-scenery. Iron now enters largely into the building of our great shops, but instead of admitting the fact and devising an architectural use for the new material, the builder disguises construction and hides his girders behind wooden shop-fronts. We still allow any individual who has the money to do so to ruin a beautiful view by raising a high blank wall around his grounds, as has happened lately on Boar's Hill.

Finally, and worst of all, our factories are as hideously

utilitarian as ever. When workmen cease to be 'hands', they will strike for due regard for their spiritual no less than for their material needs.

Because a man has a shop to mind
In time and place, since man must live,
Need spirit lack all life behind,
All stray thoughts, fancies fugitive,
All joy except what shop can give?

I want to know a butcher paints,
A baker rhymes for his pursuit,
Candlestick-maker much acquaints
His soul with song, or haply mute,
Blows out his brains upon the flute.

But shop each day and all day long—
Friend, your good angel slept, your star
Suffered eclipse, Fate did you wrong;
From where these kinds of treasures are
There should our hearts be—Christ, how far!

PART II

THE GRAMMAR OF ARCHITECTURE

CHAPTER I

INTRODUCTORY

We have more than once suggested that the parts of a building are to be studied in relation to the roof, since all subserve the essential function of providing a sheltered enclosure. It is proposed in this section to make an analysis of English building construction, studying the details of its anatomy in their relations to each other and to their common purpose, tracing the origin of its parts and their modifications throughout the historical period. The changes in detail which mark the different periods are not to be regarded as mere changes of fashion due to changing aesthetic taste; they are almost always traceable to attempts to improve the practical utility of the building—to provide a more stable roof, to improve the lighting, to remove impediments to sound and light, or to economize material and simplify construction. The modern student of architecture, like the post-Darwinian student of nature, must study the details of structure in relation to function; and, like him, he will find far more delight in the intellectual exercise than in the mere memorizing of isolated phenomena.

The church was the typical building of the Middle Ages; castles and manor houses might be built, but the church tower was the model for the one and its nave for the other. From the sixth century to the sixteenth the aims and energies of architecture were directed to the

improvement of God's House, the men who laboured upon it living in huts of straw and clay. The study of church anatomy is, therefore, the study of mediaeval building construction.

We shall have to consider in order the plan of the church, with its main divisions and their origin, the roof, both the stone vault and its timber protection, the buttresses upon which its thrusts are concentrated, the arches and the piers that carry them, the walls with their openings for doors and windows, and finally, the details of mediaeval ornament. In each instance we shall trace the subsequent history of the form through the Renaissance period down to our own day.

The Church Plan

The origin of the plan of the Christian church is to be found in that of the Roman Basilica or Court of Justice. This was an oblong hall with a semicircular recess, the apse, at one of its ends, in which sat the judge and his attendant officials. Basilica were of two types, represented in Oxford by the churches of S. Paul and S. Barnabas. In the simpler and smaller examples a single roof spanned the building from wall to wall; but where greater width was required for the accommodation of large audiences it was necessary to divide the hall longitudinally into three parts, by means of piers; arches were built upon these to carry a wall for the support of a medial roof, and the side divisions, or aisles, were roofed separately, either by lean-to roofs of timber or by cross-vaults.[1] The apse was covered by a half-dome resting upon its semicircular wall.

[1] The great arched entry to the Clarendon Press will serve to illustrate this arrangement. The central roadway is roofed with a barrel vault, flanked by groined vaults over the side passages.

Both types were copied in the churches of the early Christians, the hall becoming a nave for the worshippers, and the apse a sanctuary for the officiating priests; it was cut off from the body of the church by screens (*cancelli*), and, hence, came to be known as the chancel; the foundations of a small Romano-British church on the unaisled basilican plan were recently unearthed at Silchester; in the more important churches of Italy the aisled plan was general.

The early Romanesque builders, Saxon and Norman, built their smaller churches upon the simpler plan, but the larger churches were aisled, and aisles as well as nave ended in apses at the east. The foundations of three apses in the Canons' Gardens of Christ Church seem to indicate that the original church of S. Frideswide's nunnery was built on this plan.

But the difficulty of building semicircular walls, and still more of roofing the apse with a semi-dome, led in many cases to the building of the square-ended chancels that had been the rule in the primitive timber-built churches. So we have the plan of Elsfield Church (*c.* 1220), which was also the original plan of S. Peter's (*c.* 1120). This arrangement, at first adopted for convenience in building the smaller churches, became the prevailing fashion in England before the end of the twelfth century.[1] The east end of our own Cathedral is a conjectural reconstruction of the original plan of 1160.

The splendid Norman mind was not content with such a simple building as the basilica for the churches of bishops and abbots; the demands of an increasingly

[1] On the Continent the apse was retained in Gothic work (Fig. 25). At Tidmarsh, near Pangbourne, there is a rare English example of the thirteenth century.

FIG. 27. CENTRAL SPIRE OF CATHEDRAL (*c.* 1250)

elaborate ritual, too, and the provision of altars for saints, made necessary a more complex organization of the parts of the building. To meet the new needs the cruciform plan was evolved by carrying a second nave across the first at its junction with the chancel; this transept was usually unaisled, but in our Cathedral we have the idea carried to its full development in an aisled transept crossing an aisled nave and chancel. Over the square of intersection a tower was built, not only to give dignity to the building, and effective grouping, but to annihilate by its weight the thrusts of the arches collected at that point; and even in churches where there were no arcades the four walls of the central tower greatly simplified the difficulties arising from the meeting of the four roofs, of nave, choir, and transepts; each could be made to end in a gable against one of the four walls of the tower.

The idea of a central tower was dear to the Romanesque builders, and often, as at Iffley, we find one where there is no transept. In the great cruciform churches a central tower was always structurally necessary, and even in village churches, as at Beckley, the Gothic builders would occasionally indulge in the luxury.

But in the simpler churches, after the twelfth century, the tower was usually built at the west end, where it was of greater structural value; its weight received the thrusts of the nave arcades, which were resisted at the east by the walls of the chancel. The plan of the typical Gothic church is thus that of the aisled basilica, with a western tower, and a square chancel instead of an apse. This plan, however, is commonly the result of additions to an originally simpler building. S. Peter's Church, for instance, as first built in 1120, had nave and chancel only. A hundred years later it was enlarged by the addition of

aisles to the north of both ; this proved sufficient for the needs of the parish, and so no south aisle was added.[1] At Holywell, on the other hand, a south aisle was built to the Norman nave in the thirteenth century, and another to the north in the fifteenth, while at S. Giles's, not only were aisles added to the nave in the thirteenth century, but a choir-aisle was built to the south of the chancel. This choir-aisle probably served the purpose of a Lady Chapel ; the thirteenth century had a great enthusiasm for the worship of the Mother of Christ, and many chapels were then added to chancels in her honour. In minster churches the Lady Chapel was usually built on to the east end ; but the church of S. Frideswide was so near the city wall that there was no room to extend it eastward, and the Lady Chapel was therefore built to the north of the choir-aisle. So, too, when the Latin Chapel was contemplated in the fourteenth century it was necessary to build it still further north ; for the monastery occupied the ground to the south.

The plan of every mediaeval church reflects the worship of saints, which was an integral part of the religion of the age. In Romanesque churches the bones or other relics of holy men were usually preserved in a crypt built beneath the floor of the chancel. This 'hidden place' was intended to reproduce the catacombs in which the early Christians had been buried. At certain festivals the relics were displayed, and the worshippers were allowed to walk round the crypt and to look upon them as they passed. In the crypt of S. Peter's Church are traces of two stairways on either side of the chancel arch ; by one of these the faithful entered, and, passing round the outer

[1] But a small transeptal chapel and a porch were added in the fifteenth century.

aisle, returned by the other. After the twelfth century, relics were generally transferred to shrines in chapels built for them in the church above. Crypts were still built—there are examples beneath the churches of S. Aldate and S. Mary Magdalene and the Chapel of All Souls—but they had no ceremonial use; they were often charnel houses where bones dug up in the churchyard were preserved.

The mediaeval builders had planned so generously that few churches were necessary till long after the Reformation. The seventeenth and eighteenth centuries were the age of chapel-building by the dissenting sects. Built, unlike the churches, only for congregational worship, the chapel was rightly planned as a great rectangular hall; All Saints' Church, 1710, is typical of the post-Reformation House of Worship; the resources of the builders enabled them to dispense with obstructive piers and to build the roof of a single span. The later Gothic builders had achieved the same feat in the Divinity School, and in King's College Chapel at Cambridge. Modern architects, in returning to the aisled plan, are putting back the clock. The eighteenth-century churches and chapels are certainly ugly, but it is not because they are badly planned.

The College Plan

The origin of the quadrangular arrangement of collegiate buildings is by no means certain. Wykeham's quadrangle at New College set the type for all later colleges, and his plan is commonly supposed to have been derived from that of the mediaeval monastery. Some idea of the monastic plan may be gathered from the cloister quadrangle of Christ Church.

Seven times a day to praise God was the principal end

of a monk's existence; a monastery was, therefore, primarily a great church with adjacent buildings in which those who served it might rest and eat, and perform necessary tasks in the intervals of devotion. These subsidiary buildings were usually placed on the south side of the church, and were thus protected by its lofty ridge against the cold north winds. They were arranged in three blocks, all facing inwards upon a central cloister garth and turning dead walls to the outside world. We have seen that this was the plan of the Romano-British villa; it was also the plan of the fortified manor house; and it was obviously the best possible arrangement for shutting out enemies, whether temporal or spiritual.

On the side of the quadrangle, remote from the church, were the commissarial buildings, the kitchen, buttery, and refectory; the refectory of S. Frideswide became the library of Christ Church, and was converted into rooms in 1775, after the building of the new library in Peckwater. Opening out of the south transept of the church was the sacristry, and next was the Chapter House, in which the monks met daily to discuss the affairs of the monastery, to punish offences against discipline, or to receive orders from the abbot or prior. An arched passage or slype communicated with the graveyard outside the cloister, and near it was the mortuary. On this side, too, was the monk's day-room, and above the whole block was their dormitory, opening at its northern end into the transept of the church, into which they descended by steps for the midnight offices. On the remaining side was the lay-brothers' day-room with their dormitory above; no trace of this block remains at Christ Church.

All round the inner quadrangle ran a covered way, usually vaulted in stone, and known as the cloisters;

FIG. 28. THE MONASTIC PLAN

LIBRARIES

it was open to the central garth, and in each of its arched bays was fitted a 'carrel', a small wind-shelter, serving as a study in which a single monk could read or write.

These were the only essential monastic buildings; outside, there were doubtless barns and stores, an infirmary, and usually a mill; as wealth increased and devotion decreased, the abbot and prior built separate houses for themselves, and a great gateway, with porter's lodge, and guest-house was added; but, originally, cloister and monastery were synonymous.

Now the college plan bears only a superficial resemblance to that of a monastery; and that resemblance is probably due to like needs producing like results rather than to conscious imitation. In an age when emeutes were frequent in every city, studious quietness could only be obtained by the adoption of the ancient plan of a self-centred building. And corporate worship was always an integral part of corporate life, so that the college chapel was necessarily a very important part of its buildings. So, too, the dining-hall with its kitchen and buttery were as essential in a college as in a monastery. But with these correspondences resemblance ceases. In the monastery, the refectory and kitchen were removed as far as possible from the church; in the college, hall and chapel were covered by the same roof; college students never slept in corridor-dormitories, nor forgathered in common rooms—the common room is a post-Renaissance institution in both universities—nor worked in carrels in the cloisters.

The earliest colleges, University, Balliol, Merton, had been formed by the purchase or lease of existing private houses, sometimes not even contiguous one to another, but usually, as at Merton, forming an irregular group.

Possessing no chapel, the members used an aisle of the parish church; thus the early students of Balliol worshipped in the north aisle of S. Mary Magdalene; those of Queens in the church of S. Peter; the members of Exeter College used S. Mildred's Church, and those of Merton the church of S. John the Baptist. One of the first acts of the founder of Merton College was to rebuild the church of the parish; he left the work uncompleted, only finishing the choir for the use of the college (1297); the arches of the tower were built soon after, and the transepts were begun; but they were not finished until 1424, while the proposed nave and aisles were never carried out at all. Nevertheless, both college and parish used the church in common until the middle of the nineteenth century, when parochial services were discontinued.

The chapel of Merton, with the library, built in 1377, and the muniment room, which may have been one of the original tenements bought by the founder, formed an irregular quadrangle; possibly the library was so planned as to complete the square; at any rate this, the Mob Quadrangle, is the oldest college quadrangle in existence.

When Wykeham came to plan the first complete college in 1379, he thus had more than one precedent to guide him; there was the quadrangular plan, which was clearly as well suited to a college as to a monastery, and into which the buildings of Merton had naturally grouped themselves; and there was the detached tenement arrangement, which had been found convenient in the older colleges, since a senior member could be made responsible for the discipline in each separate house.

There was already in existence a type of building which combined both these arrangements; it was the mediaeval

inn, which was formed of separate rooms or groups of rooms built round a central courtyard, from which all were approached; the rooms on the ground floor opened on to the yard, while those of the upper story gave on to a balcony which ran at that level round the four sides of the square. It was in such courtyards that the early plays were performed.

The plan of the 'Golden Cross' in Cornmarket still suggests the original arrangement, and there is an inn at Dorchester—the 'George'—in which a part of the balcony yet remains in the yard, and of which the gateway, too, is probably original.

This quadrangular grouping of separate tenements was also the plan of the mediaeval hospital (i.e. almshouses) as we see at Ewelme.

It is evident that the college plan, as we have it at New College, is not directly derived from any one source, but is simply a convenient arrangement, of mixed parentage.

Chapel and hall being lofty buildings, it was convenient to make them in a single block and to cover them with a single high roof, running the whole length of one side of the quadrangle; the other sides were occupied by the rooms of the members. Each 'staircase' represents one of the halls or houses of which the earlier colleges were composed. But it is only in comparatively recent times that any member, except the heads of the college, enjoyed the luxury of a room or rooms to himself. Originally each set of rooms consisted of one large apartment with a fireplace and two big windows, and opening out of it two, three, or four small studies, each lighted by a small window. The men occupying the set used the large room as a common sitting-room by day, and as a sleeping-room by night. The senior man slept on a tall fixed

bed, beneath which the truckle beds of his camerales (chums) were pushed out of the way in the daytime. In the grouping of the windows of the older colleges this original arrangement can usually be traced, even though the partitions between the studies have been knocked out to form a single large bedroom.

The origin of the plan adopted by Wykeham for the chapel of his college is a disputed point. It was formerly supposed that it was suggested by the unfinished chapel of Merton, which was found to be very convenient, the choir for worship, the transept for lectures in divinity, &c. But it has lately been held that the indebtedness is on the other side, that Wykeham's idea of a college chapel was seen to be so suitable for its purpose that the dons of Merton decided not to carry on the work farther than the transepts. However that may be, the plan of Wykeham's chapel, like that of his college, remained the type for all later builders.

The Elevation

We have seen that even the plan of a mediaeval church was largely conditioned by the roof-building skill of the founders. The majority of the Saxon churches seem to have consisted of a nave and chancel only, covered either by a single timber roof resting on the side walls, or separately by two such roofs at different levels. This simple arrangement was adopted in small churches at all periods, e. g. at Elsfield, Besilsleigh, and the Hinkseys. The span of a timber roof is, of course, limited by the length of the beams available. Where a wide area had to be roofed, it was necessary to divide it longitudinally into three parts, and to roof each part separately. Inner

walls, carried by two rows of arches, supported a medial roof, and the aisles were covered by lean-to roofs sloping up from the top of the outer walls to the bottom of the inner. The nave, therefore, depended for its light mainly upon the windows in the aisle walls, which still, in many churches, are the principal source of illumination.

It is customary to speak of the 'dim religious light' in our old churches as if their builders had aimed at producing a sense of mystery in the brooding shadows. The truth is otherwise; the dim light inevitably resulted from the system of roofing. Moreover, it was the constant endeavour of mediaeval builders to increase the amount of light in their churches.

In order to provide the nave with an independent source of light, the walls which carried its roof, and were themselves carried by the arcades, were raised sufficiently high above the aisle roofs as to allow of the insertion of a range of small windows known as a clear-story. In some churches, e.g. Holywell, this is an improvement of later builders, but in large churches it is usually a part of the original plan.

Where the church was on a grand scale, the height of the aisle roof was such that it sloped up to a line considerably above that of the crowns of the nave-arches. The clear-story wall carried by them had, therefore, to be raised so that the sills of its windows were above that line. This left a band of blank wall between them and the arches of the arcade. To save material, to lessen the weight upon the arches, and to get rid of this blank wall, it was pierced, or rather replaced, by a row of small arches carried by the nave arcades and carrying, in turn the wall of the clear-story above. Thus, in a great mediaeval church, three stories can be distinguished, the

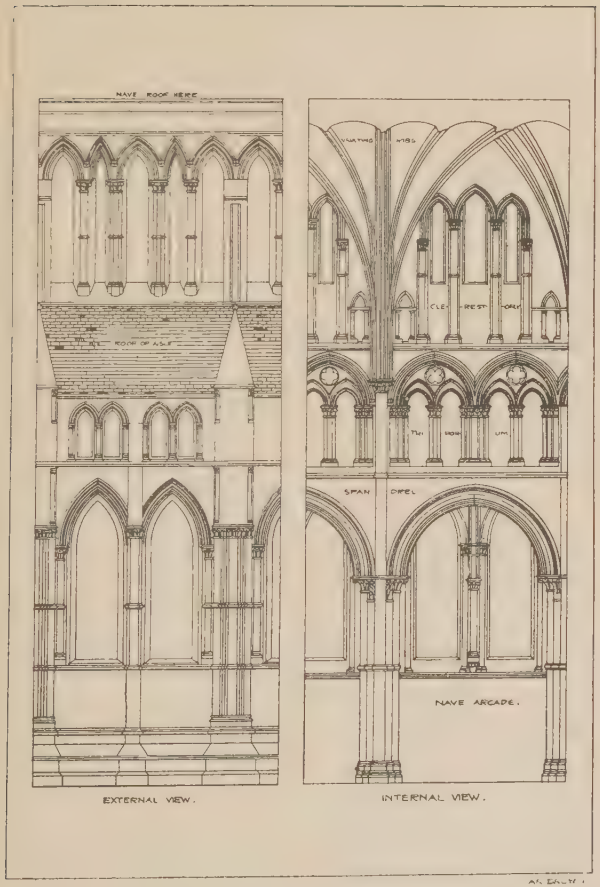


FIG. 29. TYPICAL GOTHIC ELEVATION

nave arcade, the clear-story, and, between them, the triforium, often called the blind-story because, since its arches are below the level of the aisle roof, it transmits no light to the nave. Outside, only two stories are visible, in the windows of the aisle and those of the clear-story above.

In our own cathedral, which is the only local church built with a triforium, a strange modification of the usual plan has been adopted. The nave-arches rise to the level of the sills of the clear-story windows, and carry the clear-story wall without the intervention of triforium-arches. These, which are hence rendered structurally useless, are inserted in the tympana of the great arches of the nave, and are carried by lower arches springing from corbels half-way up the piers. This remarkable arrangement appears to have been originally tried at Romsey, but was there abandoned in favour of the usual plan. The Oxford builders also departed from it in building the upper stories of the tower.

In many churches the nave receives a large part of its light from the west end of the building. In Norman and Early Gothic times, when windows were small, the west wall was pierced with several openings, as is the case at Iffley. In later work one great window, often the largest in the building, took the place of the group of smaller ones; the west window of S. Peter's, inserted in the older Norman wall in the fifteenth century, is a good example. Where there was a western tower its arch was raised to a great height so as to cut off none of the light entering from the west.

The other end of the nave received a certain amount of light from the windows of the chancel, and especially from the eastern wall, which, like the western, was pierced either with several small windows, as at S. Michael's (*c.* 1220),

or with one large one, as at S. Peter's (1410). Where the chancel arch was low, as in early work, and cut off the light from the east, or where, as was sometimes the case, its tympanum was boarded up, a window was cut through the wall above it, and above the level of the chancel roof. Such a window may be seen at Great Milton.

CHAPTER II

THE VAULT

It was the great ambition of mediaeval architects to roof their buildings with stone, partly because it was more architectural and more consistent with the rest of the edifice, but mainly because a vaulted building was thus rendered fire-proof; for fires were frequent in an age when houses were built of wood and thatch, and were destructive when they could only be extinguished by the summary method of pulling down the burning building with a hook kept for the purpose in the parish church.

Almost all the few examples of Saxon vaulting are to be found in crypts, where the surrounding earth prevented the arched roof from spreading, and so obviated the difficulties of providing abutment.

The Normans, of course, were more enterprising, and all their important buildings were vaulted more or less completely. The aisles were so planned that their width was equal to the distance between the nave piers. It was thus possible to divide them into squares, covering each square (or bay) with a groined vault springing from the four angles. Two of the four thrusts of the vault were taken by the piers of the nave, their oblique pressure being neutralized by the vertical weight of the clear-story

wall; the other two were received at corresponding points on the wall of the aisle, which was made very massive to withstand them. Norman crypts were similarly cross-vaulted by division into squares, and slypes or passages were ceiled by means of barrel vaults.

But the problem of spanning the great medial space of the nave with a stone roof baffled generation after generation. Two difficulties, apparently insuperable, were involved in it: the nave was wider than the aisles, and, therefore, wider than the spaces between its piers; so each of its bays was an oblong and not to be roofed by cross-vaulting. And then, even if a high vault could be constructed, how could its thrusts be prevented from forcing apart the clear-story walls, and so bringing all to the ground? Attempts were made to ceil the nave with a barrel vault,[1] but, in order to resist its thrust, the clear-story walls had to be made so massive that the arches below were overweighted. Other solutions were tried in England, France, and Germany, but a really satisfactory one was not reached until the end of the twelfth century. That solution brought the Gothic style into existence; or, more correctly, it marks the passing of Norman architecture into the first of the stages of that known as Gothic.

It was the progress made in vaulting the aisles that brought into sight a practicable method of vaulting the nave. In constructing a groined vault, a wooden framework was necessary, upon which the sections of the tunnels could be formed; when the sections were completed the centring was removed, and they 'locked' themselves by mutual pressure. But very early in the twelfth century somebody, somewhere, had discovered that, if merely a skeleton framework of the intersecting curves of the groins

[1] Cf. the middle archway of the Clarendon Press.

FIG. 30. CRYPT OF S. PETER'S IN THE EAST (*c.* 1120)

FIG. 31. VAULT OF CHANCEL, S. PETER'S
Showing Norman ribs with enrichments.

were made, stone arches could be formed upon it, and the four curved surfaces between them could be filled in one at a time with a single section of centring used in succession for each. The arches forming the skeleton of the vault have been well named 'ribs'; and the sectional method was a great advance on the Roman system of building the vault as a whole, since it resulted in a great saving of centring, the planks for which were hard to come by before the age of saw-mills; indeed, the difficulties of constructing even the centring for a vault of great span would have been almost insuperable by any but the skeletal method.

The reader will appreciate the advantages of the new plan if he compares the groined vault of the crypt of S. Peter's with the ribbed vault of the chancel. The crypt had to be divided into fifteen small squares, and a corresponding number of piers were necessary at the angles. Then a complete set of cross-vault centring was constructed, and used for each square in succession. But since pillars would have been very inconvenient in the chancel above, it was divided into two great squares, so large that it would have been very difficult to construct complete sections of centring for cross-vaults, and instead of attempting to do so, the builders simply made two intersecting arches of wood, built the diagonal ribs of the eastern vault upon them, moved them to the western bay and repeated the process, and then, with one section of centring, filled in each web successively. The development of the new idea, of ribbed vaulting, is nowhere more completely illustrated than in the roofing of our own Cathedral. It is probably not too much to say that the student, having the successive stages of progress side by side for comparison, may learn more of the history of

vaulting in half an hour well spent in the Cathedral precincts than in a week of visits to isolated examples.

The study of the development of vaulting is the study of progressive changes in the curvature, the section, and the number of the ribs employed. The building of the

FIG. 32. VAULT-RIB: PRIMITIVE TYPE

FIG. 33. VAULT-RIB: TYPICAL NORMAN

Cathedral was begun at the east end (*c.* 1160), and the earliest vault is that of the south choir-aisle. Here the ribs are typical Norman; besides the diagonal ribs marking the groins of the cross-vault, there are transverse arches over the aisle defining the limits of each square or 'bay' of vaulting, east and west; all four arches are very heavy and massive; but the transverse ribs are of the primitive type, square in section; the groin-ribs are

semicircular, and therefore lighter in comparison. In order to make all the ribs rise to the same level in the crown of the vault the builders were obliged to give the transverse arches a stilted or horseshoe form; for since the height of a round arch is always half its span, they

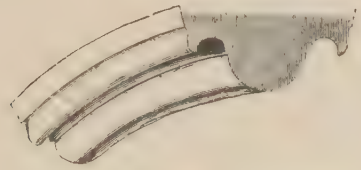


FIG. 34. VAULT-RIB: TRANSITIONAL

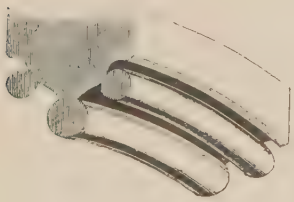


FIG. 35. VAULT-RIB: EARLY ENGLISH

would not otherwise have reached the level of the wider diagonal arches. In vaulting the north choir-aisle the same expedient was adopted. The lighter ribs of the transept aisle show that the builders had begun to realize that they had been wasting material in constructing massive arches to support the thin shell of vault between them, but they still know of no better way of bringing arches of unequal span to the same level than that of stilting the narrower.

Then came the true solution, the discovery that arches of varying span can all be made of the same height if they are formed by intersecting arcs of two circles instead of being struck from a single centre; in other words, if they are made with pointed instead of semicircular heads. The round arches of the transept aisle are the last of that form in the Cathedral, but which was the first of the new is a more open question.

The vault-ribs of the north aisle of the nave resemble those of the transept aisle in section, but the transverse arches have pointed heads instead of the clumsy stilted form. The most easterly of these may be the first pointed arch in the building. It is, however, more probable that the new form was first adopted in building the arches of the tower. The transept is so much narrower than the nave that its two tower-arches, north and south, could only reach the level of the eastern and western ones by being made with pointed heads. The builders would hardly have planned an oblong tower unless they had designed these arches from the first.

The south aisle of the nave was the last to be vaulted; the ribs are lighter, are moulded into a pear-shaped form, and their surface is relieved with narrow bands called fillets. We shall treat of mouldings in another chapter, but it may be said here that the moulded ribs of this aisle, pear-shaped and filleted, are extremely good examples of the early days of Gothic.

In the work of the next generation, in the vault of the Lady Chapel (*c.* 1210), and of the Chapter House (*c.* 1220), the result of the introduction of the pointed arch is at once evident: while the ribs have decreased in size, they have increased in number. This development was inevitable now that any number of arches could be brought

FIG. 36. VAULT-RIBS IN CATHEDRAL

The rearmost show the mouldings of the twelfth century, the foremost those of the fourteenth, and the ribs springing from the central column those of the thirteenth.

to the same level irrespective of their span; so here, besides the diagonal and transverse ribs we have wall-ribs to north and south, so that the vault rests upon six arches, and its thrusts are brought down to its four angles by means of twelve ribs, springing in threes from the piers or vaulting-shafts. The bays of the Chapter House afford a particularly good illustration of the advantages arising from the elastic proportions of the pointed arch; they are narrow oblongs, and so the wall-arches are acutely pointed, while the transverse arches are obtuse, and the diagonals are semicircular; yet all rise to a common level in the crown of the vault.

Now that the ribs were becoming so thin it was not easy to mitre them at the vertices; the workmen seem to have discovered this in building the vault of the Lady Chapel, for in vaulting the Chapter House they adopted the simpler plan of fitting them into a common keystone or 'boss' at their junction in the crown of the vault.

The Gothic treatment of bosses serves admirably to illustrate the true architectural principle of beautified construction as opposed to the false one of applied ornament; the boss is simply a workman's device to simplify his task, but the artist-workman of early Gothic days made it at the same time a means of beautifying the vault it knit together. How art and science can be united in architecture may be seen in the bosses of the Chapter House, or in the wonderful pendants of the choir, which are simply elongated bosses.

The next step, which is illustrated in the vault of the Latin Chapel, was to connect the bosses at the crowns of the rib-arches by means of short horizontal ribs called ridge-ribs, so binding them all together by a sort of

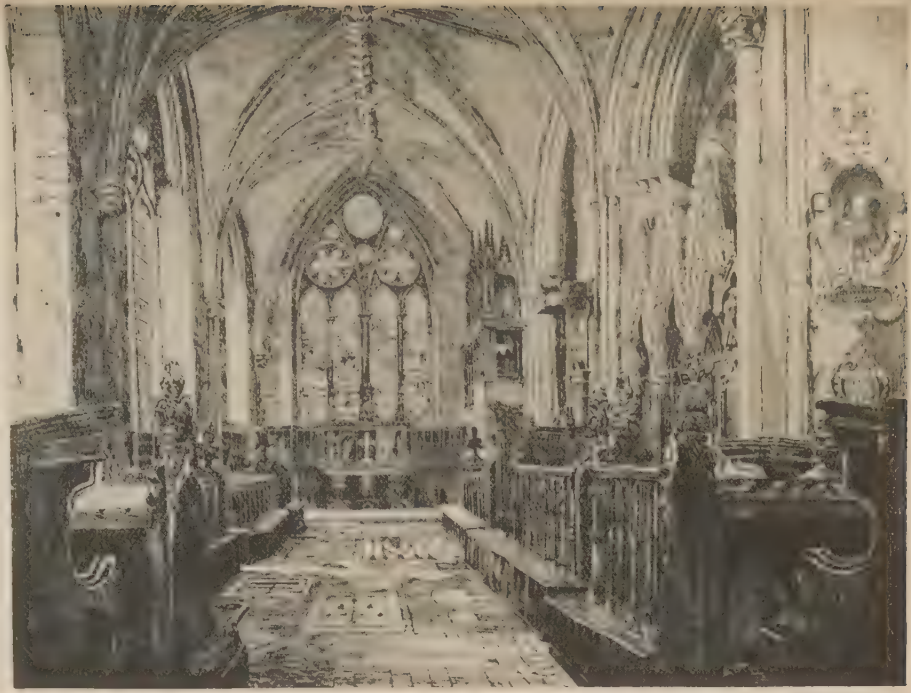


FIG. 37. LATIN CHAPEL, CHRIST CHURCH (*c.* 1350)
Showing ridge-ribs and bosses in the vault.

continuous keystone. Thus a further advance was suggested; it was to break up the thrusts of the vault still further by introducing intermediate ribs (tiercerons) springing from the angles and rising to the ridge-ribs midway between the vertices of the main arches, as in the vault of the cloisters and in Exeter College Chapel and the Gateway of Merton. The final step, seen in the vault of the choir, was to bind all the ribs together by short horizontal braces called liernes, which were often so disposed, e.g. in the roof of the Proscholium, as to produce star-shaped patterns in the crown of the vault; hence the term stellar vaulting for this kind of work. The simplest type of lierne vault is that under the Warden's Lodge at Merton.

By the introduction of tiercerons and lierne ribs, the skeleton became a network, with interstices so small as to be bridged over with single flat stones; thus centring, except for the main ribs, became unnecessary. Also, the vault was reduced in thickness to a mere shell, exercising very little thrust; and so piers, arches, and vaulting-shafts could be made correspondingly lighter, and with less cost for material. It therefore became possible even for the village builders to gratify themselves and their little society by building a stone roof. But most village churches were already sufficient in size for the needs of the community. That is why we find so many vaulted porches added to older churches in the fourteenth and fifteenth centuries.

All through the fifteenth century and well into the sixteenth (in Oxford, indeed, in the seventeenth) lierne vaulting remained popular. But after the middle of the fourteenth century it shared its popularity with a rival form, to which itself had given birth. This was the

FIG. 38. STAIRCASE, CHRIST CHURCH (1640)
Showing fan-tracery vaulting.

beautiful fan-tracery vaulting, which was invented at Tewkesbury and perfected in the cloisters of Gloucester (*c.* 1400). Most of our local examples are of late date; the earliest is the vaulted passage to All Souls Chapel (*c.* 1440), and the finest is the vault of the stairway to Christ Church Hall, built in 1640.

Having thus briefly traced the development of vaulting from the groined roof of S. Peter's crypt to the fan-traceried vault of the Christ Church stairway, we must go back to our original twelfth-century problem of how to poise a stone roof on the clear-story walls of an aisled nave. As we have seen, one part of the problem had been solved before the end of the century, when the introduction of the pointed arch had made it possible to vault an oblong bay as easily as a square one. Before the end of the century, too, the builders had realized that the stability of a vault depended not so much upon the general mass of the wall as upon the provision of sufficient abutment at the points where its thrusts were concentrated at the springing of the rib-arches. These points, therefore, they fortified with heavy piers, and by building masses of solid masonry against the walls of aisles at the points where the vault-thrusts were received. But clear-story walls could not be so fortified; if they were made massive enough to withstand the thrusts of the vault, they would overload the arches below; neither could buttresses be built against them, because the ground was already occupied by the aisles of the nave.

The builders of the Cathedral seem to have thought that the pointed arch had solved all their vaulting problems; and when they had finished the aisles they began, as their vaulting-shafts show, upon the ceiling of the transept. Then they must have realized that though

they could put a vault up, they could not find means to keep it up, and so they abandoned the idea and made their high roofs of timber. Meanwhile, in France, had they but known it, the problem had been solved. Opposite the points in the clear-story walls where the thrusts of the vault were concentrated, the French architects built solid masses of masonry outside the walls of the aisle; and, by means of stone bars above the aisle roof, transmitted to these the thrusts of the vault-arches. Thus, if the external buttresses were heavy enough to stand upright against the outward thrusts transmitted by the flying buttresses, the vault would remain stable till the stones crumbled from sheer decay.

We have in Oxford no ancient example of a high vault sustained by flying buttresses; by the fifteenth century, when the choir of the Cathedral was vaulted, arches had become so depressed, and their reduced thrusts were so broken up among the network of ribs, that the mass of the clear-story wall alone provided sufficient abutment. The choir-vault, too, springs from so low a level that its outward thrusts are met and partly neutralized by the inward push of the vaulting-arches of the aisles. Mr. Bodley's church of the Society of S. John the Evangelist affords a good modern illustration of the use of the flying buttress; the thrusts of the stone arches of the nave roof are transmitted over the aisles to external buttresses, which, loaded as they are with pinnacles, are massive enough to annihilate them. The west wall of the Wesleyan Chapel in Walton Street is also fortified with small flying buttresses to enable it to support the thrusts of the arches of the nave arcades. The architect wished to build a vestibule against this wall, and, therefore, was obliged to move his buttresses back and transmit the

pressure to them by means of flying buttresses above its roof.

The reader may perhaps wonder why I have devoted so much time to the subject of vaulting, when stone-roofed buildings are so rare; still more, why I have treated of flying buttresses, having none but modern illustrations. In the succeeding chapters I hope to make it clear that almost every detail of an unvaulted building finds its origin in a vaulted one, and owes its form to its relation with a vaulted roof. And it is impossible to appreciate Gothic architecture unless we can realize that it is a system of building in which the thrusts of arches are concentrated and absorbed at fixed points by inert masses; the buttress, not the pointed arch, is the essential feature of Gothic: and the function of the buttress is best realized when it is seen as an external mass of masonry whose sole *raison d'être* is to receive transmitted thrusts.

That in all our modern Gothic we have so few vaulted roofs shows how little the revivalists understood the principles of the style. The timber roofs they copied are really confessions of weakness in the original builders —they lacked either the means or the skill to bring their work to its logical conclusion. Buttresses that abut no arches are as futile as niches that contain no images: but the modern builder continues to produce both.

CHAPTER III

THE BUTTRESS

The history of the buttress might almost be said to be the history of Gothic architecture. It, and not the pointed arch, is the touch-stone of Gothic.

The buttress had been used by the Romans, but was not trusted by them nor by the Romanesque builders who followed them ; they preferred to rely on the massive solidity of their walls. But in a pure Gothic building, e. g. the Divinity School or the Sainte Chapelle as represented by the Chapel of Exeter College, the walls

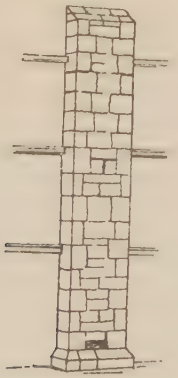


Fig. 39. Norman Buttress

are screens, not supports ; they might be made entirely of glass, or even removed altogether, and the roof would still remain poised aloft, balanced upon its shafts and buttresses.

The essential function of the buttress is to resist oblique thrusts ; but it serves another purpose, that of binding and unifying the wall in which it is built ; this is, of course, its only purpose in an unvaulted building. Its use greatly economized material, both by relieving the

walls of weight and by allowing them to be made thinner with no sacrifice of strength; for it is obvious that a Gothic wall two feet thick, with buttresses projecting three feet, is as strong as an unbuttressed Romanesque wall of double its thickness.

The Saxons used no buttresses; they strengthened their walls by 'long and short work'—long stones, alternately vertical and horizontal, built into the wall as in the angles of S. Michael's tower. The Norman builders, as may be seen at Iffley, tied their rubble walls at intervals with broad flat bands of squared stones built vertically into the wall and projecting slightly from its face. But these are clearly not designed to take the thrusts of the roof; they are therefore not true buttresses, and their origin is rather to be found in the pilasters with which the Greek and Roman builders broke up the blank faces of their walls; they may be compared with the pilasters on the front of the Ashmolean Museum. The somewhat similar strips set in pairs at the eastern angles of the church are typical of the work of the next generation (*c.* 1200); the thin shaft on the angle is an easily recognized mark of the transitional buttress. They may possibly have been built when the chancel was lengthened, and for the purpose of supporting the new vault; if so, they must be regarded as true buttresses, the earliest examples we have; but that their united weight was insufficient for its purpose is clear from the deep buttresses added in the fourteenth century, and the modern pair set against the east wall (Fig. 40).

But the thirteenth-century builders soon discovered that what was wanted in a buttress was mass, and they increased their projection accordingly, e.g. in the

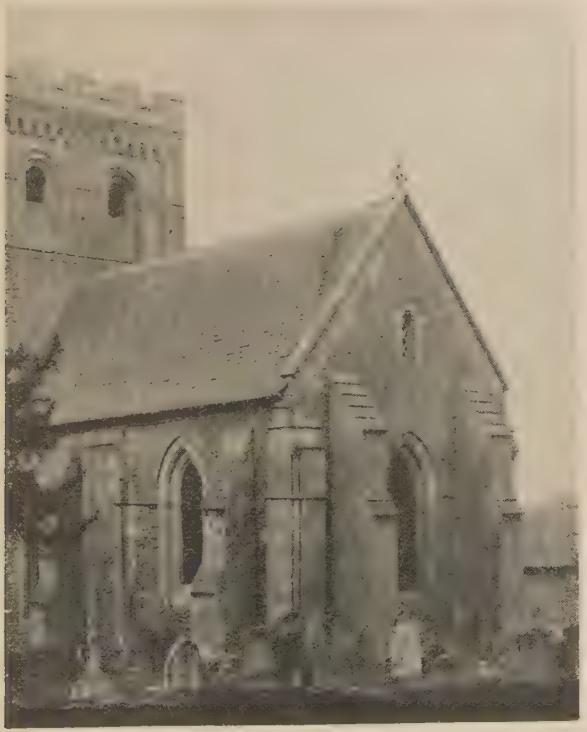


FIG. 40. IFFLEY CHURCH, EAST END

buttresses of the Chapter House (*c.* 1220). They saw, too, that walls might now be made thinner, but they did not

Fig. 41. Buttress, S. Mary Magdalene (*c.* 1337)

realize how much thinner, and so the walls of the Chapter House are still very massive. Neither did they appreciate the fact that depth, not width, was the important dimen-

sion in a buttress, and at first material was wasted in both these ways.

The early practice of setting small buttresses in pairs at the angles of buildings, at the east ends of Iffley and Cowley Churches, for example, soon gave way to the more economical method of building one large buttress diagonally against the corner, as in the south aisle of S. Mary Magdalene. Soon, too, the thirteenth-century builders realized that the thrusts of the roof passed gradually outwards and downwards, and so they increased the projection of their buttresses from the top downwards, i.e. they built them in diminishing stages from the ground to the roof. In the first half of the century the tops were made to slope into the wall at or below the line of the eaves; but later on, as in Merton Choir (*c.* 1297), they were carried above the wall and crowned with a gablet. This not only threw off the rain, but by its vertical weight assisted the buttress to resist oblique thrusts. The builders of the south aisle of S. Mary Magdalene Church (*c.* 1337), appreciating this, loaded their buttresses with pinnacles. The two examples last mentioned illustrate once more the artist spirit in Gothic work; the buttress, in essence a mere inert lump of heaviness, is so treated that one knows not whether to admire more its structural efficiency or its artistic beauty; and that though the peculiar beauty of the fourteenth-century buttress, the niched image, has been ravished by brutal ignorance. Beautiful as they remain, the central object on which the supreme care of the carver was lavished has disappeared, and only its setting remains for our admiration. There was almost as much labour in a single perfect fourteenth-century buttress as there is in the Martyrs' Memorial.

The buttresses of the next period, e.g. in New College Chapel (1386) or the Divinity School (1450), show even more science, but less art. It had become clear that thrusts

FIG. 42. BUTTRESS, DIVINITY SCHOOL (*c.* 1450)

were to be met by projection, i.e. depth, in the buttress, and so we have the deep thin type seen in the buildings quoted. But here the architect is saving labour as well

as material; and what is worse, he is stinting design. Any one could cover a buttress with panels like those of the Divinity School. These buttresses were built to support the most ingenious vault yet seen in England, or in the world; yet they proclaim that the end of Gothic art was in sight; they are covered with cheap ornament, and though science may clean your carpets for a pittance, cheap art never has been nor ever will be.

When the Classic styles were revived, the Roman principle of disguising abutment caused the buttress to be abandoned; the last buttresses to be built in Oxford, until the revival of Gothic, were the huge ugly masses in Exeter College Gardens, piled up against the Divinity School by Wren to support its walls against the weight of the books in the library above.

CHAPTER IV

THE ARCH

The function of the arch is to carry weight, usually that of the mass of wall above an opening; this weight, of course, exerts a vertical pressure, but the arch transmits it to its supports obliquely, tending, like a bent spring, to force them apart; they will only remain immovable when the vertical pull of gravity on their mass is stronger than the oblique thrust of the arch; in other words, the thrust of the arch is met by the inertia of a dead weight, which is termed the abutment of the arch. The weight of the abutment is really set in balance against the weight carried by the arch.

But if two equal arches meet at a common springing,

as in a nave arcade or on the piers of a bridge, the tendency of the one to push over its support is nullified by the opposing thrust of the other, and the resultant of the two forces is a vertical pressure needing no abutment; the *mass* of the support at this point is therefore of no importance, since it has only to resist compression. In the nave arcade of S. Giles's Church, for example, the only points where abutment is needed are at the western springing of the western arch, and the eastern springing of the eastern one. The thrust at the first point is taken by the dead weight of the tower wall, and that at the other by the wall of the chancel. This is the structural purpose of the western tower; where it does not exist, as in S. Mary's Church, its place is taken by two massive buttresses set against the western wall in line with the arcades. The massive piers of central towers are similarly explained; they have not only to support the weight of the tower, but to resist the thrusts of the arches that abut upon them, in which, of course, they are helped by the dead load above them.

The arches of a bridge neutralize each other's thrusts where they meet upon the piers in mid-stream; it is only upon the banks that they require abutment, and this is afforded by the mass of roadway forming the landward approach to the bridge.

In Roman and in Romanesque buildings down to the twelfth century the semicircular arch was employed; its weakest point is its crown, i.e. the very point where the greatest weight falls upon it. The pointed arch, on the other hand, is strongest at its vertex, and for this reason was occasionally used by the Normans very early in the twelfth century, as being the superior weight-carrier.

Much has been written about the 'discovery' of the

pointed arch, which is often said to have been invented by the Gothic builders, or borrowed by them from the Saracens. But it had been known and appreciated as a weight-carrier long before, and indeed, like the semicircular form, is probably prehistoric. So long as the round arch served all their purposes the Romanesque builders preferred that form, perhaps because it was easier to construct (since the method was traditional), perhaps because they considered it more beautiful: certainly it was the form of the great arch type, the heaven that encompassed all. But pointed arches are by no means uncommon in Norman work; they may be seen, for example, in the ornamental arcade on the south wall of S. Peter's Church (Fig. 66), where their formation by intersecting semicircles is clearly shown.

The builders of the late twelfth century no more discovered the pointed arch than the Romans did the round one; what they did discover was its application to the problems of vault construction with which they were faced, and which its elastic proportions enabled them to solve. Once admitted into the vault, it spread to the rest of the building. But the round arch persisted long after Norman times; it may be seen, for instance, in the porch of Cuddesdon Church in a gateway of about 1300. The doorways of that church, too, are round arched, though all their details are Early Gothic, and the tower-arches of the same date are pointed.

The typical arch of the thirteenth century (*c.* 1190–1270) is of the lancet form, acutely pointed, and formed by the intersection of two equal circles, each having its centre outside the circumference of the other. Then, as windows increased in size, the equilateral arch became general; it was formed by the intersection of two equal

circles, the centre of each being in the circumference of the other (Euc. I, 3). This is the typical arch of 'Decorated' work (*c.* 1270–1350), though it was frequently used at every period.

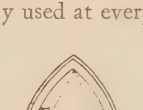


FIG. 43. LANCET ARCH

FIG. 44. EQUILATERAL ARCH

Early in the fourteenth century the ogee arch was discovered, and soon came into general use. It is formed of arcs of four circles, and was suggested by the line of double curvature formed by the combinations of circles in the geometrical window-tracery of the late thirteenth century. It really 'discovered itself' in the window, and

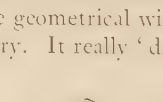


FIG. 45. DROP ARCH

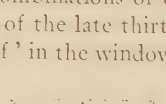


FIG. 46. OGEE ARCH

the window was always its realm, for it is too weak for use as a weight-carrier. It is essentially a decorative arch, and is common over tombs and niches, e.g. over a tomb-recess at Waterperry (Fig. 122), and in the niches of S. Mary Magdalene buttresses. A small doorway in Witney Church has an ogee arch, and in some districts, e.g. Northamptonshire, window-arches of this form are not uncommon. In the heads of the lights the ogee arch is almost universal

in the fourteenth and fifteenth centuries, and its curves dominate the tracery from about 1310 almost to the end

FIG. 47. FOUR-CENTRED ARCH

FIG. 48. LATE FOUR-CENTRED ARCH

FIG. 49. FOURTEENTH-CENTURY DOORWAY, WITNEY

of the century. It was one of the few Gothic forms that had any attraction for Wren, who used it in his doorway to the Divinity School (Fig. 17), and in the curves of his

dome at Christ Church; he seems also to have altered the arch of the great window over the gateway to make it correspond with the dome above.

Another ornamental form, in the thirteenth century, was the trefoil arch, formed from three circles having their centres at the angles of an equilateral triangle. This had been occasionally employed by the Romanesque builders. There is a trefoil-headed doorway at Charlbury, but the form is seldom used for large arches; it is oftenest seen in the heads of recesses, e.g. in the sedilia at Iffley, or in the heads of window-lights, as in the east window at Northmoor (Fig. 90).

In the latter half of the fourteenth century the builders, who were experimenting with fan-tracery vaulting, discovered a form of arch that simplified the construction of their vaults. They found that this new and convenient arch—which they had hit upon empirically—was formed of arcs of four circles, i.e. like the ogee arch, it was struck from four centres; but, unlike the ogee form, it was sufficiently strong to be used as a weight-carrier. As it was employed everywhere in subsequent work it came to be known as *the* four-centred arch. It was flatter and wider than the earlier forms, and so it was welcomed by the builders, who were being called upon for larger windows. It is so characteristic of the work done in the building revival that followed the Wars of the Roses that it has been called the Tudor arch; it is the arch of S. Mary's Church and Christ Church: but it is also the arch of New College, built a century before Bosworth (Fig. 47).

A debased form of the four-centred arch is very characteristic of Late Gothic work: the arch becomes a gable curving only at its springing, as in the head of the doorway of Kettel Hall (Fig. 48). From this to the

FIG. 50. INTERIOR OF S. MARY'S (*c.* 1488)

flat-headed windows of Stuart Gothic, as seen in the Old Schools, is but a short step. This 'gabled' arch is anticipated in a curious fourteenth-century window in the chancel at North Hinksey, and in a similar one in the transept chapel at Cumnor. It should be said here that though the building system of the Middle Ages was essentially an arcuated one, yet the lintel never entirely disappeared; the simplest way to roof a small opening is to bridge it with a long stone, and doors and windows were so treated at all periods. In the south wall of Cowley Church (Fig. 97), for instance, every window has a flat head; yet those in the chancel are of the thirteenth century, one in the nave is of the fourteenth, and another is of the late fifteenth. In humble domestic architecture, too, where timber-work was the rule, doors and windows must certainly have been lintelled.

The Priest's Door of S. Thomas's Church illustrates a form that was in use in the thirteenth century; two stone brackets or corbels project from the angles of the opening, thus lessening its span, and a long stone rests upon them to form the head of the door. This construction has been called the corbelled arch or the shouldered arch, but it is really a corbelled lintel, and in no sense an arch, since it exercises no thrust. It was used in building Carnarvon Castle and the other fortresses of Edward I—hence it is sometimes known as the Carnarvon arch—and it is conspicuous in the modern front of Balliol College.

In the fourteenth century segmental arches are sometimes found in the window-heads. In eighteenth-century work this form is common, and is employed, for example, in the windows of the Clarendon Building (Fig. 21).

Having discussed thus briefly the function and forms

Fig. 51. Priest's Door, S. Thomas's (*c.* 1220)

of the arch, we pass on to consider the method of its construction. And here the application of what has been called the biological method to the study of architecture, the attempt to approach the subject rather from the scientific than the artistic side, will lead to some interesting conclusions. We shall discover, for instance, that the beauty of the famous west doorway of Iffley results inevitably from the Romanesque method of arch-building, and is not, like a picture or a statue, a beautiful creation of a single mind; we shall find that the graceful clustered shafts of the Lady Chapel were not, as used to be believed, suggested by twin-trunks or grouped pine-trees; that they were never, in fact, conceived as ideas by any one, but shaped themselves inevitably to a form best suited to the construction of the arches they carry. They *are* beautiful: but their beauty, like that of the horse or the honeysuckle, arises from the perfect fitness of their structure to its purpose.

When an arch is to be constructed, the builders have first to make a wooden framework of the required size and shape, and to place it upon the supports designed for the arch. Upon this temporary structure they build the first ring of the arch, usually of wedge-shaped stones called voussoirs. These are allowed to set, and then they themselves form a supporting arch for other rings to be built above them. When the Roman builder made an arch, he had such massive stones at his disposal that he could build the first ring the full thickness of the complete arch; e.g. if his arch spanned an opening in a wall four feet thick he could obtain voussoirs of that width; and, moreover, he had appliances by which such great stones could be lifted into position. But the Romanesque workman had no such resources; he had to construct an arch

in a four-foot wall with small stones, raised by rude tackle; and he had not the necessary timber for the massive centring necessary for Roman arches. Therefore he was driven to devise a new plan: setting his frail centring in the middle of the archway, he built upon it

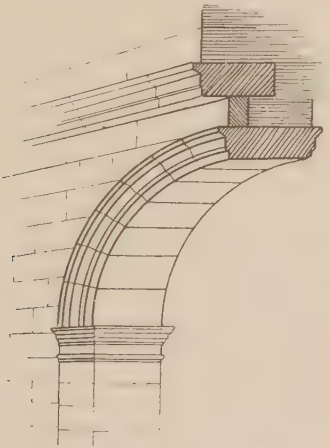


FIG. 52. ARCH CONSTRUCTION, ROMAN METHOD

with small voussoirs one thin arch; upon this as a centring he laid a second ring, composed not of single voussoirs, but of stones set in pairs, so that their edges projected over the face of the first ring on both sides, producing a broader surface on which a third and still wider ring could be constructed. By increasing the number of rings he could make his arch of any desired thickness. But, the soffit or underside of an arch so constructed would not be flat as in a Roman arch cut straight through the wall, but

broken up and 'recessed' as many times as there were orders, i. e. rings. In order to give unity to this composition, the Romanesque builders chamfered off the angles of each ring and carved ornaments on the sloping surface so produced. The inner orders of the Chapter House doorway are so treated; but the two outer orders have

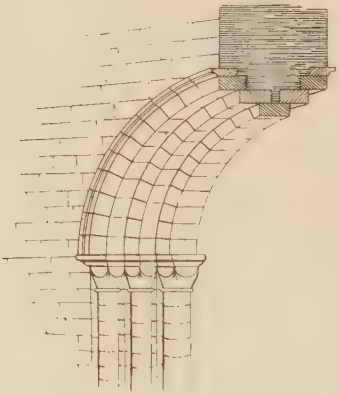


Fig. 53. Arch Construction, Mediaeval Method

had their angles rounded into the form of a bold roll called a torus. At Iffley and S. Peter's the inner orders are similarly treated, and the torus on the two outer ones is ornamented with beak-heads. In Late Norman work the angles of the orders are generally moulded, i. e. rounded off, instead of being chamfered and ornamented. In the chancel arch of the Cathedral, for instance, the outer orders are moulded, the edges of the inner ones being left with their original square edges.

In Gothic work the method of construction was the same, but the arch was relieved by mouldings and not by carved ornament as in Norman times. In work of the early thirteenth century one can usually trace the original rings of the arch, since the mouldings are cut on the chamfered faces of the angles; but in later work the unity of the arch is complete, and the suites of mouldings are independent of the orders in which it was constructed. But if these are sometimes not easily to be detected in the arch, the evidence of their existence is generally to be found in the pier, to which we have now to turn our attention.

CHAPTER V

THE PIER

The pier is the columnar mass of masonry that supports the springing of an arch and receives its thrust. It thus differs from the Classic column both in function and in structure; the former supported the vertical pressure of a lintel and consisted of a monolith of marble or of drums of stone; the latter, having to resist an oblique pressure, must be more massive, and is therefore built of courses of masonry. The Romans, who introduced the arch, refused to recognize its complement, the pier, and sinned against the first law of architecture, that design should express construction, by disguising it with columns carved on its face. The Romanesque builders had not the skill, even if they had the wish, so to disguise construction, and in their work the pier is unmasked, as the buttress is in that of their successors.

The Roman arch consisted of a single ring ; its supporting pier was therefore a simple square or oblong prism (Fig. 52). But the Romanesque and Gothic arches were built in rings, each ring or order requiring its own proper

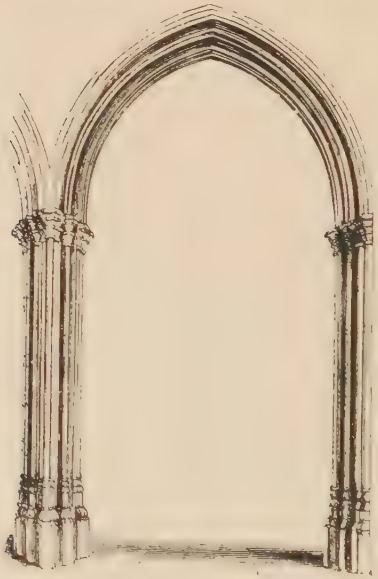


Fig. 54. Arch and Piers, S. Mary's, A.D. 1488

support (Fig. 53) ; moreover, in vaulted buildings the ribs of the vault also came down to the pier, and each needed its proper shaft from which to spring. Therefore the post-Roman pier, like the post-Roman arch, is composite ; is a combination of grouped members, each supporting an order

of the arch or a rib of the vault. The only alternative is a great circular pier supporting all the orders and ribs, and in early Romanesque work this form is not uncommon, since it was easy to construct. But the truth-loving Teutonic mind demanded a clear correspondence between the load and the carrier, and in later work each order in the arch has its proper support in the pier. Oxford, however, even in the twelfth century, appears to have been strongly conservative, clinging then, as it did until the other day, to older methods; so in the Cathedral we find all the orders of a recessed arch brought down to one large circular pier. But in the next century logic prevailed even here, and the composite structure of the arches of the Lady Chapel is acknowledged in the clustered columns of the supporting piers.

The later Norman builders sometimes emphasized this correspondence by employing detached shafts to carry the orders of an arch. This practice suggested a means of increasing the contrasts of light and shade by the use of shafts of a different stone. The magnificent tower-arch of Iffley owes much of its effect to the massive shafts of black marble that carry the orders. The use of marble shafts became common in the next century in the greater churches; the poorer builders could not afford them, for the supply in England was practically limited to the marble of Purbeck, and the cost of transport was too heavy. The labour and expense of turning many separate columns made detached shafts the exception in parish churches. The only instance of the use of Purbeck marble in Oxford is in the small shafts of Prior Sutton's tomb in the Cathedral (*c.* 1300). Detached shafts of stone are found in a few buildings, but only in small arches, as in the south doorway of S. Giles's. By the end of the

FIG. 55. THIRTEENTH-CENTURY PIERS, S. PETER'S

Fig. 56. Thirteenth-century Pier, Holywell Church

thirteenth century builders everywhere had become content to do what had been done in the piers of the Lady Chapel and of S. Peter's, viz. to carve engaged shafts on a central core.

In parish churches at all periods the early economical plan, of making a single simple pier carry all the orders of the larger arches, was the general rule. Such piers were either circular or hexagonal[1] until the fifteenth century, when they were usually octagonal. In Holywell Church the thirteenth-century piers of the south arcade, like those of S. Giles's, are cylindrical; those of the fifteenth century on the north are octagonal in plan; so too are the late fourteenth-century piers of S. Mary Magdalene and the fifteenth-century ones of S. Michael's. But by the fifteenth century, even in village churches, the builders had become such skilful craftsmen that they were usually able to make the form of their pier correspond to the orders of the arch. So, alike in the arches of Wykeham in New College Chapel, and in those of the village craftsmen at Eynsham, Beckley, and Ewelme, the orders of the arch rest upon corresponding members in the supporting pier. We may mourn the failing art in fifteenth-century work, but we have to set against it the increase in constructive science. This is seen as well in the mass of the piers as in their form. The late fourteenth-century piers at Islip or Clifton Hampden, for example, do the same work as the twelfth-century piers in the opposite aisles, with half the expenditure of material.

The pier, like the column, has three parts, the capital, shaft, and base. The capital is a bracket which, accommodating its shape and size below to the pier and above to its load, enables the former to carry the arch of a wall

[1] Rarely octagonal.

FIG. 57. TOWER PIERS, MERTON COLLEGE (*c.* 1300)

wider than itself; in its most elementary shape the capital would therefore be an inverted truncated cone. But no mediaeval builder would have been content to leave it thus; the artist spirit transformed it into a graceful bell, sometimes decorated with carved foliage, sometimes ringed about with mouldings.

The Romanesque builders, confronted with the task of making a pier support a load wider than itself, placed upon it a cube of stone equal in width to the thickness

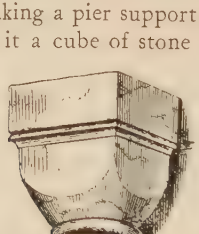


FIG. 58. CUSHION CAPITAL, CASSINGTON (*c.* 1140)

FIG. 59. SCALLOP CAPITAL (*c.* 1160)

of the arch, and rounded off the lower angles, so producing the form known as the cushion capital. This may be seen in its simplest form in the crypt of S. Peter's. The first step in its elaboration was the refining of its broad round faces by grooves like those in a scallop-shell, which increased the play of light and shade; so was produced the scallop capital seen in the south doorway of Cowley Church. The cushion capital was also ornamented with rude figure-sculpture carved in relief. Those of the south doorway at Iffley are world famous, and illustrate the dominating ideas of the warlike age in which

they were cut. As Norman passes into Gothic these semi-barbaric ornaments are abandoned, and the capital is decorated with leaf-forms, not apparently derived from any specific plant, but suggested, perhaps, by the acanthus leaves of the Corinthian column. The capitals in the nave and choir of the Cathedral are very representative of the

FIG. 60. CAPITAL IN CATHEDRAL (*c.* 1180)

work of this period, and the student who will go a little farther afield will find other good examples in the capitals of the nave arcades of Appleton, Haseley, and Islip, in doorways at Holton and Cuddesdon, and in the chancel arch of Elsfield. The capitals in Chesterton Church and some of those at Appleton, show plainly the stages of evolution from the scalloped form of the twelfth century

to the foliaged capital of the thirteenth. One peculiarity of this transition period is the presence of a volute of tightly-curled foliage at the angles of the capital; it is very well illustrated at Elsfield.

Logic demanded that the load and its support should be clearly differentiated, and so the line of contact between arch and capital is marked by a member called the abacus. In Romanesque work, as in Roman, the abacus is usually a square tile-like stone. On the Continent this form was retained in Gothic work, but in England, after the Gothic style was firmly established, the abacus was made circular. Moreover, though in Norman work its plan was sometimes round, its upper edge was always square. But after the twelfth century, not only was the abacus circular in plan, but its edges were rounded off so that it showed no angles either in plan or elevation (Fig. 62). An almost infallible test for the work of the last quarter of the twelfth century is the presence of a square abacus on a capital decorated with foliage.[1]

The rounding of its uppermost member gave to the Gothic capital a bell-like contour, which it never wholly lost, even when after the thirteenth century it was made polygonal in plan. But it was most beautiful when most bell-shaped, i.e. in the thirteenth century. Then, in a typical capital—such as those in the Chapter House—leaves spring from the necking where the capital rests on the pier, thrust themselves upward close pressed against the bell, and then, as if their upward growth were stayed by the abacus, curl over and break into fronds of foliage. These leaves have all the beauty of natural

[1] A thirteenth-century capital on the south-east respond of Bicester Church is the only English exception known to the writer.

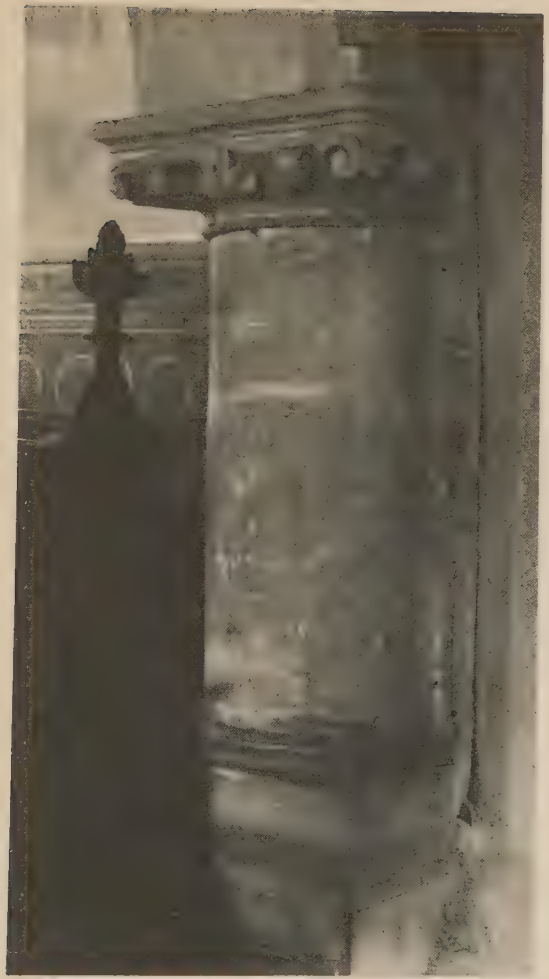


FIG. 61. PIER OF CHANCEL ARCH, ELSFIELD (*c.* 1200)
Showing typical transitional capital with square abacus and volute of foliage, and water-holding base.

leafage, but it is an abstract beauty, not a copy of a particular plant. No natural leaf could so combine dissimilar qualities—give strong support to the abacus, and then, relaxing its stiffness, wreathe it round with wind-blown lightness. As craftsmanship increased, the workman tried his hand on natural foliage, producing, for instance, the lovely bosses of leafage—of oak, maple, vine, ivy, and bryony—seen on S. Frideswide's shrine; but the frail leaves, however beautiful, could not be made to express support; instead of lending strength to the capital, they clung to it as parasites: they were beautiful ornaments, not beautified construction.

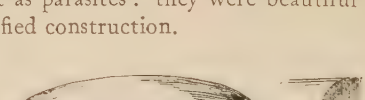


FIG. 62. CAPITAL (*c.* 1220)

Still, by the end of the thirteenth century the naturalistic capital had everywhere superseded the stiff-stalked type. Though inferior in design to the latter, it required great skill in its execution, and is therefore seldom seen in parish churches. S. Giles's, S. Peter's (Fig. 55), Holywell (Fig. 56), have stiff-stalked foliage on the caps of their thirteenth-century piers and shafts, but no parish church in or near Oxford could command the services of workmen able to carve naturalistic capitals; after the thirteenth century, common men had to be content with mouldings instead of leaf-carvings.[1]

[1] The moulded capital was always common even in the thirteenth century, as in the south arcade of Holywell, the north arcade of S. Giles's, and the chapel of S. Peter's.

Builders who could afford it, used the naturalistic capital all through the fourteenth century. But the carving steadily deteriorated; the marvellous leafage on S. Frideswide's shrine was copied from leaves growing in Oxfordshire lanes in the summer of 1289 or thereabouts; a hundred years later all such fidelity to nature had disappeared; conventional leaves were again in fashion; but this time not because strength as well as beauty was wanted in the foliage, but because conventional leaves were easier to cut. The thirteenth-century foliage had both beauty and structural expression; that of the fourteenth had the one without the other; but

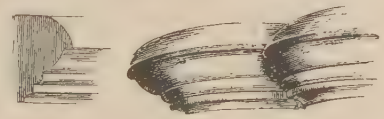


FIG. 63. CAPITAL, MERTON COLLEGE CHAPEL (*c.* 1280)

the foliage on fifteenth-century capitals has neither; it sticks on the bell like a dead parasite, as may be seen on examining the capitals in the Cathedral cloisters.

Though the characteristic Gothic capital is decorated with foliage, the moulded capital was common at all periods. The development of Gothic mouldings will be considered in a later chapter, when it will be seen that a capital can be dated by the mouldings as certainly as by the leafage. It is here sufficient to say that the piers of the south arcade of Holywell, of the two arcades of S. Giles's, and of the chapel-arches of S. Peter's, have moulded capitals of the thirteenth century; the tower-arches of Merton (Figs. 57 and 63) and the vaulting-shafts of the Latin Chapel (Fig. 36) have moulded capitals of the fourteenth;

and the piers of S. Mary's nave, and of the ante-chapels of New College and All Souls, show on their capitals the characteristic mouldings of fifteenth-century work. It

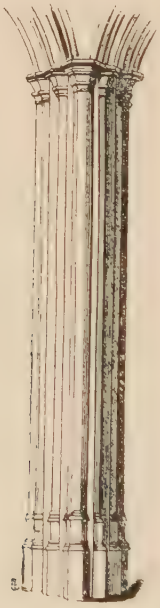


Fig. 64. Pier, S. Mary's, A.D. 1488

will be seen in the examples last mentioned that the abacus of the fifteenth century is a concave-sided polygon in plan, a circumstance which is alone sufficient to distinguish a Late Gothic capital from those of earlier date.

In order to lower the centre of gravity in his scaffolding,

the modern builder plants his poles in tubs of clay; so a mediaeval builder sought to give stability to his piers by setting them upon substantial bases of stone.

The Norman piers, like the columns of the Doric Order, were themselves so massive as to need little weighting at their feet. The pier was placed upon a square plinth, and a bold roll-moulding concealed the circular line of junction; in the angles left between the circle and the square a spur of ornament was often placed, especially in late work. In the transition period two plinths are superimposed, and the roll-moulding upon them is hollowed out to receive the pier, so that a deep groove runs round the foot of the latter. The base characterized by this channel is known as the 'water-holding' (Fig. 61); it is well seen in the Cathedral and in the buttress-shafts at the east end of Iffley Church. The water-holding hollow was retained in Gothic work well into the thirteenth century, for instance, in the bases of the piers in the south arcade of Holywell Church (Fig. 56); but the square plinth did not long survive the square abacus. Henceforward, the plan of the base corresponds more or less to that of the shaft.

As the pier grows thinner in the fourteenth and fifteenth centuries bases increase in size, and especially in height. The fifteenth-century bases to the piers of S. Mary's, for instance, are four feet high. Wooden seats, which before had been luxuries confined to the choir and chancel, were now introduced into the nave, hiding from view the low bases of earlier days. So the bases now built were carried up above the seats, at the level of which most of the mouldings were placed, the lower courses being left plain, as in the piers of the north arcades of S. Mary Magdalene and Holywell. The bases of the

former illustrate a common characteristic of the fifteenth-century type; their circumference is greatest, not at the level of the floor as in earlier bases, but at the level of their lowest mouldings, which are worked on a projecting course of masonry overhanging a plain pedestal. The bases of the shafts (Fig. 69) in the jambs of the doors and

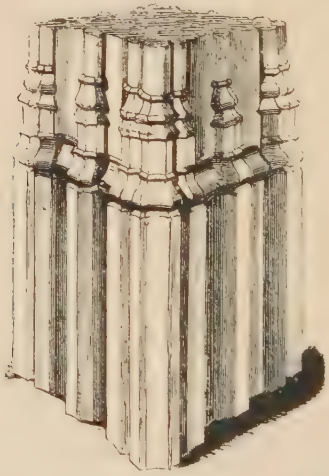


Fig. 65. Fifteenth-century Base, S. Mary's, 1488

windows in Merton transepts (*c.* 1425), and especially those in the north doorway (Fig. 80), are fine examples of the fifteenth-century pedestal base.

The piers of the Lady Chapel in S. Mary Magdalene Church have neither capitals nor bases, and other examples of this illogical arrangement may occasionally be met with—for instance, in the north arcade at Clifton Hamp-

den. The explanation is generally that the arches were not built upon piers first set up to receive them, but were cut through an already existing wall, the piers representing portions of it left to support them. The S. Mary Magdalene Chapel was built by the Carmelite Friars of Beaumont, in the second quarter of the fourteenth century, against what was then the south wall of the church. At first it was a separate building, approached by the lane still known as Friars' Entry. Afterwards it was desired to throw it into the church, and to save labour the old wall was left standing, merely being pierced with arched openings. The thirteenth-century builders at S. Giles's had had to do the same thing when they built the north aisle of that church, but they did it in a more architectural way. They cut arches through the upper part of the wall, as may be seen from the traces of the original clear-story windows, and supporting them on temporary props, built piers with capitals and bases, no doubt using a strip of the old wall as a central core for each pier.

CHAPTER VI

THE ROOF

We have said that if the reader could imagine a typical Gothic building with its walls and their windows and doorways all removed, the skeleton then remaining would represent the essential parts of Gothic construction. With this fundamental structure, the vault with its supports of arch, pier, and buttress, we have hitherto been dealing in this section on the grammar of architecture. One other adjunct to the skeleton remains to be considered before we pass on to discuss the walls with their openings.

The Romans had roofed their more important buildings with groined vaults of such massive strength that their arches could carry upon their crowns a flat covering of cement or flagstones, forming at once a roof and a terrace. The ambition of mediaeval builders was to build, *more Romanorum*, with stone throughout; but though at last they rivalled the Roman in skill, they never possessed his resources of material, and they were always obliged to protect the external face of their vaults by a mask of tiles on a framework of rafters.

A few roofs do exist composed entirely of stone, that of the thirteenth-century Muniment Room at Merton College is an example; but that is not a vaulted roof, but simply one in which a framework of stone rafters supports the flags. Even the Renaissance architects were usually content with wooden roofs—though we have small examples of stone in the domes of Queen's College Gateway and All Souls Cloisters; and the modern architect, when called upon to build a stone roof, generally supports it upon iron girders, as in the roof-playground of the South Oxford school.

Since a timber covering must be constructed, whether a vault is beneath it or not, it is obvious that the builders of parish churches had generally to be content with that part of the complete roof which kept out the weather, especially as this part was much the easier and cheaper to construct. But it must be repeated that Gothic architecture was developed, not in the parish churches, but in the masons' schools of abbeys and cathedrals; and that forms originally invented in relation to vaulting problems were *copied* in parish churches, even though these were unvaulted.

The function of the roof being to throw off rain and

snow, its structure must obviously bear reference to prevalent conditions of climate. In the sunny climate of Greece, when a separate roof-mask had to be built to protect a perishable ceiling, it was made with a very low pitch, in harmony with the prevailing horizontal line; its triangular end thus formed a low pediment and not a gable. This was often filled with figure-sculpture in relief, as in the eighteenth-century pediments of Queen's College. Early roofs in our own rainy island were of very steep pitch; the gable angle being sometimes one of 45° in a thirteenth-century building. Norman roofs were also steeply sloped; though very few now remain, their original pitch may usually be seen on the face of the central tower. The original twelfth-century roof of the Cathedral was particularly acute, as may be seen from the well-marked angle on the tower-faces (Fig. 27).

The eastern gable of S. Peter's Church, too, shows the pitch of the original Norman roof (Fig. 66); its small window is very interesting; it must once have lighted a room above the vaulting of the chancel, used perhaps by the priests or the sacristan. The pitch of the existing roof is of the same date as the porch, which also has a room above its vaulting, and thither the fifteenth-century occupant must have transferred his quarters. The little window in the eastern gable of Iffley (Fig. 40) still lights a space between the vault and the timber-roof, which is accessible from the tower.

The roof of Merton Choir, built in the last years of the thirteenth century, is an excellent example of the high-pitched Early Gothic roof; the gables of S. Giles's Church also retain the sharp angles of the thirteenth century.

FIG. 66. S. PETER'S IN THE EAST

Steeply-pitched roofs, however, are usually modern restorations of the original form; most of our existing ancient roofs are of the fifteenth century, built when the low four-centred arch dominated the building. The low-pitched roofs then put up are not to be regarded as a mere fashion, significant of lower ideals in their builders. They are certainly not so beautiful as the high gables and shaly slopes of earlier roofs with their long ridges cutting the skyline like a distant mountain-range, but they are to be explained and justified on constructional grounds; the case against the fifteenth-century artist is clear enough without any evidence from his roofs, which, like all his construction, tells rather on the other side.

In the first place, owing to an improved system of roof-drainage, presently to be described, the high pitch was no longer a necessity, and it was in accordance with all Gothic tradition to use no more material than was necessary; labour was lavished freely to beautify what was useful, but material was never wasted for the mere sake of effect on the eye. Long beams and rafters were scarce and dear, short ones common and cheaper; moreover, their use reduced the superficial area of the roof; hence the fifteenth-century preference for roofs of low pitch. Where an old roof had to be rebuilt, the argument from economy is still stronger When, for instance, the fifteenth-century builders found it necessary to pull down the high-pitched Norman roof of S. Peter's Church, they must have had plenty of sound timber to use again. Beams and rafters decay most where they rest upon the walls and at their junction with each other, i.e. at their ends; if the rotten ends are sawn off, shorter lengths of sound wood remain to be used again in a roof of lower pitch.

But there is yet another reason for the flatness of Late

Gothic roofs. The development of lead-mines in the fifteenth century enabled the builder to cover his rafters with sheets of that metal instead of tiles. But lead on a steeply sloped roof would tear itself away from its fastenings by its own weight and by its expansion and contraction in sun and frost. Finally, while ruddy tiles and lichened shingles are picturesque in themselves, and add to the charm of a building, a lead roof can never be beautiful, and on artistic grounds alone the builders were justified in sinking its pitch and hiding it from view by a decorated parapet running round its eaves.

Mention of the parapet leads us to a consideration of the way in which the drainage of the roof was effected. The system in general use in Norman and Early Gothic times was invented when the first roof was constructed in the world, and is in use now in every thatched barn and cottage. It is the simple plan of dripping eaves. In order that the drippings shall not run down the walls and so in time destroy them, the eaves of the roof are made to project above the top of the wall, so that the water shoots off and sinks into the ground some distance from the foot of the building, leaving walls and foundations free from damp.

The early roof was therefore wider than the space it covered, and so it rested, not immediately upon the wall itself, but upon a projecting course of masonry built out upon blocks of stone, forming a row of brackets known as a corbel-table. The corbels, of course, were generally made an ornamental feature, as in the fine corbel-table of S. Peter's (Fig. 66); those of the Cathedral eaves (Fig. 27) are plainer, and those of Iffley show that the Norman builders never completed their work, since a carved face here and there indicates their intention of

beautifying their corbels as they had done their capitals.[1] An Early English corbel-table, carrying pointed arches which support the projecting eaves, may be seen in the tower of the Cathedral below the springing of the spire (Fig. 27).

It will be seen, however, that most Norman corbel-tables now carry, not the roof, but a projecting parapet, usually of the fifteenth century. The roof, moreover, instead of being wider than the building, is narrower, and its rafters rest on the inner half of the thickness of the wall; there are therefore no dripping eaves.

The drainage of the roof of Merton Choir illustrates the new system which was invented in the latter part of the thirteenth century. It will be seen that a thin parapet was built, partly upon a corbel-table of grotesque heads, partly upon the outer portion of the thickness of the wall; inside the parapet runs a deep gutter, lined with lead to prevent the water from soaking into the wall; and sloping up from the inner side of this is the roof, its rafters resting on the remaining surface of the top of the wall. At intervals along the length of the gutter the parapet is pierced with projecting spouts of stone called gargoyles—even these are ornamental as well as useful—and the whole drainage of the roof is concentrated at these points, and by the force of its own volume is shot out clear of the building.

The gutter was a great improvement upon the dripping eaves, and after the thirteenth century it became the rule in the roofing of all large buildings and in the rebuilding of older roofs. That is why the twelfth-century

[1] Similarly, a single richly ornamented window on the south face of the tower shows that the belfry-story, fine as it is, falls short of the beauty of the original design.

corbel-table of S. Peter's now carries a fifteenth-century parapet. But the corbel-table was usually dispensed with in new work, and parapet, gutter, and roof were carried by the top of the wall.

It is possible that the new plan of parapet and gutter was suggested by the curtain-walls of military fortifications. The top of the city walls, which were built or rebuilt in the reign of Henry III, forms a terrace along which a watchman could walk, or on which archers could take post if the city were attacked. A thin curtain-wall, loop-holed and embattled, built upon its outer edge, protected the defenders from the arrows of the enemy. This may well have suggested to the builders of Merton the idea of a parapet safeguarding a narrow space on the top of the wall, which should be at once a gutter and a path by which men could walk round the building for purposes of defence or for inspection and repair of the fabric. There can be no doubt that the church-builders of the Middle Ages built always with mingled ideas of worship and war. Their iron-bound doors with massive locks and beam or bar from jamb to jamb are alone a proof of this; the narrow windows of early times, high-set in the walls, and the iron stanchions of later days, have the same significance. The tower might be a landmark to the traveller in the pathless waste, a home for the bells, and an abutment for the nave-arches, but it was also a fortress for the villagers, and with its narrow winding stair and unscalable faces it was an impregnable refuge in time of need. The tower of S. Michael's was at once a part of the church and of the city fortifications; that of New College was both a muniment-room and a bastion. Like Durham Cathedral, every church tower was—

Half church of God: half castle.

Fig. 67. The City Wall

The military value of a parapet must have had a good deal to do with its popularity. Along the eaves of the low aisle roofs it was usually little more than an ornamental rail, as in the fourteenth-century south aisle of S. Mary Magdalene, but on more defensible buildings, and especially on towers, it was always embattled for archery. Of course, the builders appreciated too, the beauty of a battlemented outline; one sign of failing artistic sense in late Gothic is the introduction of diminutive battlements in all sorts of incongruous situations, as for instance, along the transoms of the large fifteenth-century window of S. Peter's. The presence of decorative battlements among the ornaments of the Martyrs' Memorial is a similar artistic blunder, and is the less excusable because the artists of the original crosses were never guilty of such confusion of ideas.

Throughout the Middle Ages the church, the hall, and the tithe barn, were roofed in the same way by the same workmen; there is a thirteenth-century barn at Coxwell which is roofed by means of piers and arches, and buttressed exactly like a church, except that the work is plainer. The cottage was a one-storied building with a thatched roof, upon the open beams of which the fowls perched at night above the heads of the sleepers; even in the town houses, as we learn from the 'Miller's Tale', the beams were open to the room beneath, and there was no upper story. But with the rise of a middle class, with the increase of population, and its concentration in towns, storied buildings became necessary, and rooms had to be planned in the space immediately below the rafters.

This affected the form of the roof, since these rooms must be lighted by windows; so the dormer- or roof-window came into use; it was at this time that upper

FIG. 68. S. MARY MAGDALENE CHURCH

stories were added to so many of the colleges, for instance, New College, Brasenose, and Corpus; the 'cock-lofts' of Trinity show how the dormer window made rooms in a space which once had really been the roosting-place of the 'cock beneath the thatch'. In Flanders, where the woollen manufacture had brought a wealthy trading-class into existence, house-building had developed much earlier; the curved gables in the eaves of University and Oriel show the influence of Flemish domestic architecture on English builders.

In the seventeenth century the roof was often hipped, i.e. it was made without gables, sloping from its ridge to four eaves instead of two; there is a good roof of this kind on the Alms-houses in S. Clement's, built in the reign of Queen Anne; a common eighteenth-century form was the Mansard roof, invented by a Frenchman of that name; it gave more head-room in the attics; the roof of the Radcliffe Infirmary (1770) is a good example.

Upper stories in houses made stairs necessary; the upper floors in mediaeval buildings, where they existed, e.g. in keeps and in church towers, were approached by means of newel-stairways, narrow and winding in a spiral, or by external steps like those that give access to a modern stable-loft; such inconvenient arrangements could serve no longer, and so the splendid Elizabethan and Jacobean staircases came into existence. At this time, too, the boards that formed the floor of the upper story were hidden from below by means of lath and plaster ceilings. These at first were decoratively treated, being divided into panels like a fifteenth-century vault and embossed with painted ornament in relief. We have nothing to compare with the ceiling of the Combination Room of S. John's College, Cambridge, but there is a fine Eliza-

bethan example at All Souls, and seventeenth-century examples in houses in Holywell and Magdalen Street. In Georgian days the plain whitewashed ceilings of to-day became general, and even the carved timbers of earlier open roofs were hidden by them, as may be seen at Wood Eaton and in the hall of Jesus College. The open timber roof of University College Hall was hidden by a plaster abomination until 1904, when its original appearance was restored.

The Spire

Before we leave the subject of roofs something must be said of the one feature of mediaeval building construction, in which material was used obviously and primarily for the mere sake of producing an effect upon the eye. The single Gothic luxury, and that not a common one, was the spire

And even the spire had a constructional origin and even a structural use; its germ is to be found in the low pyramid that roofed the Norman tower. Few of these remain, but the tower-roof of Dorchester Abbey is a reconstruction of the original form. Raise the height of the square pyramid, and you have a spire in embryo. But the faces of a square pyramid present four broad surfaces to the pressure of the wind; more angles are necessary if the spire is to stand safely; an octagonal pyramid on the square tower is obviously suggested. That is the form of the Gothic spire.

It is almost incomprehensible that Oxford, always distrustful of new notions, should have produced what is often said to be the earliest spire in England. Grafted on a building twenty years behind its time, S. Frideswide's spire is so 'stumpy' in its proportions that it must be regarded as an experiment; its windows prove that it belongs to the first half of the thirteenth century, and

it is often assigned to the early years of that period. Of that, however, there is no evidence either way, and it is, *a priori*, more likely that it is a cautious Oxonian experiment made in the middle of the century when spires had been built in other places. Otherwise, we have to believe that men in Oxford who built a Romanesque cathedral when their contemporaries at Ripon were building in pure Gothic, were succeeded by sons who were as much in advance of their time as their fathers had been behind it. It is not the custom of Oxford to move so fast.

But, if our claim to possess the earliest spire in England cannot be proved, we can surely boast the possession of the most beautiful in 'minaret crowned S. Mary's':

> That peerless spire
> S. Mary's own, so fair, so free,
> The flower of perfect symmetry.

The tower and spire of S. Mary's belong to the latter part of the thirteenth century. It is sometimes said that the plain stately tower was not originally built for the beautiful coronal it carries. Those who hold this view can know little of either the art or the methods of the thirteenth century. A building then was not completed by contract in a fixed time by relays of workmen, but was the growth of a generation. One generation planned it and commenced to build; another finished the work, as men and material could be obtained. The lower windows of S. Mary's tower show that the building was begun about 1265; the windows in the next story are at least ten years later, and so are the mouldings of the tower-arches. By 1280 or a little later, the tower must have been ready to receive its spire, which, by its profusion of ball-flowers, must have been completed about 1300.

Of course, the builders of 1265 did not foresee the precise form that was to crown their work; but their great buttresses show that they were building towards a spire. Moreover, the plainness of their work proves, not that they were planning a humble superstructure, but precisely the opposite; the spire was to be their glory, and with consummate art they designed to heighten the beauty of the blossom by contrast with the stem from which it sprang. It remained for later and less gifted architects to cover their buildings with ornament, and to produce as much monotony by its profusion as would have marked its total absence. Magdalen Tower, the most beautiful of Late Gothic buildings, is so because its builders remembered what had been forgotten for a century, and lavished all their ornaments on its topmost story.

We have said that the spire is not without structural purpose: it serves to weight the tower, as the pinnacle weights the buttress, and to help it in resisting the thrusts of arches. But its great function is the artistic one of grouping around it all the parts of the building into one harmonious whole.

The pinnacles at the base of a thirteenth-century spire likewise fulfil both constructional and artistic purposes. They not only lead the eye to where the central shaft springs heavenward, but by their weight they deflect its thrusts in a vertical direction. Further, the spire is an octagonal pyramid supported by a square tower; hence, while four faces rest upon the tower walls, the other four have to be carried by arched supports, called squinches, built in its angles. The pinnacles at these points hide the junction and convert tower and spire into one composition. After the thirteenth century (when the advantages of the

parapet in facilitating repairs had been appreciated) this was effected by means of a parapet round the base of the spire, and so the pinnacles were omitted. The fifteenth-century spire of Kidlington is an example of the parapetted type that superseded the broach spires of the thirteenth century.

CHAPTER VII

THE WALL

The wall has usually a double function; it serves as a screen enclosing a roofed space and as a support for the roof itself. In Romanesque buildings every wall fulfils both these functions, but in the more highly organized Gothic construction the walls are relieved of weight and become thin screens of masonry—or rather of glass and masonry, for windows occupy a large part of their surface: the 'walls' of the Divinity School, for example, may almost be said to be sheets of glass. A building is more or less Gothic according to the degree in which the weight-bearing function is transferred from the wall to the buttress; the Divinity School is, therefore, the best example of Gothic construction that Oxford possesses.

The Romanesque wall was necessarily thick and massive. Owing to lack of skill in the workmen, both masons and toolmakers, it was built of rubble, i.e. of unhewn stones. In Saxon times squared stones were so difficult to obtain that they were economized to the utmost; so in the corners of the buildings, where they were necessary to form the right-angled quoins, the long squared stones are set upright, the shorter ones are laid horizontally between them, and so is produced the 'long and short' work seen in the angles of S. Michael's tower (Fig. 10).

In Gothic buildings the thickness of the wall varies inversely with the projection of the buttress. Thirteenth-century walls are still very massive, containing so much material that they are usually of rubble, though they may be faced with squared stones. But, as the builders learned to trust the buttress, less and less material was required, and so they were able to use squared stones throughout. The fifteenth-century wall even in humble churches is frequently of ashlar.

But squared stones are expensive, however economically they may be used, and a cheap substitute was soon sought for; it had been sought for, and found, yet earlier when even the mighty eastern empires and wealthy Rome herself had eked out the supply of ashlar by rectangular slabs of baked clay.

But with the fall of Rome brickmaking became a lost art. The barbarians of Italy found an apparently inexhaustible quarry of hewn stones in her temples and palaces; those of France and England fell back on rubble; and then, as the demand for finer material revived, bricks were re-invented after a lapse of a thousand years.

It was, naturally, in those flat districts where clay is common and stone rare, that the builders were first driven to the re-discovery. Bricks were made in Flanders in the thirteenth century, and were used in the east of England before the end of that period. In our own district, where stone is plentiful, we have few examples of early brickwork; the hospital at Ewelme, built in 1440, and the porch of Sutton Courtney Church a hundred years later, are almost the only local illustrations of the art before the increase of population made brick the universal material for house-building. I say universal, because even buildings apparently made of stone

are in modern times composed of brick with a mere facing of ashlar. The builders of Keble College were more honest; but their work unfortunately does little to enforce the truth of the proverb.

An examination of early brickwork shows that, though the English might be indebted to the Flemish for the material, they invented their own method of using it.

In Flemish work all the courses are alike, each consisting of bricks showing long and short faces alternately; in the early English examples a course of bricks all showing a long face alternates vertically with another in which all the bricks show their narrow ends; this arrangement is therefore known as the English bond. It is stronger than the Flemish bond, but it went out of fashion in the seventeenth century, and was superseded by the Flemish method still followed by the modern bricklayer.[1]

The companion art of tile-making either survived the fall of Rome or was much sooner rediscovered; tiles were certainly made in Normandy before the Conquest. They were used both in the roofs and in the flooring of mediaeval buildings in Oxford; where the Stonesfield shingles were available, we have 'stone roofs grey and old', but in the walls of village churches many a bit of red roof-tile, used to level up an uneven course of rubble, indicates that the modern slate roof was preceded by one of tiles. The roof was so exposed to the elements that all our ancient examples are of thick shingles; but mediaeval floor-tiles are common in most of our local churches. They are usually about five inches square and one inch

[1] Since this was written, I have seen 'English' bond in the brickwork of the thirteenth-century Binnehof at The Hague and in other early Dutch examples. The truth probably is that the English retained the older method when the Dutch had abandoned it for the new.

thick. While the clay was still soft a pattern was stamped upon them, and the hollow thus formed was inlaid with clay of another colour; when the tile was dry it was glazed and baked, and the pattern became as imperishable as the tile itself. There are fine examples in the floor of Merton College Library.

We have already seen how the mediaeval wall was protected from the disintegrating action of the drippings from the roof; but further provision was made to ensure that raindrops blown against the face of the building should be prevented from trickling down into the foundations, or from depositing sediment on the glass of the windows.

Round the head of each window a little ridge of stone juts out like an eyebrow—and, indeed, serves the same purpose; at the level of the springing of the arch it is continued horizontally along the face of the wall and round the buttresses, rising into an arch again at the next window. This projecting band is known as a string-course; that part of it which overarches the window-head is called the hood-mould; and when, as often happens in fifteenth-century buildings, it forms a square frame over an arch (Fig. 38), it is distinguished as a label. From its function the string-course is often described as the drip-stone, but it is frequently found on inner walls, where the term cannot properly be applied.

This, however, suggests its second purpose, viz. to act as a binding-course, strengthening and unifying the wall. Its value in this respect is well seen at Iffley (Fig. 11), where the heavy strings round the building recall the binding-courses in the rubble walls of Roman Silchester and Verulamium. But the string-course is an element of beauty, not less than of strength; it relieves the face

Fig. 69. North Transept, Merton College Chapel (*c.* 1420)

of the dead wall, and by its strong horizontal line corrects the appearance of disproportionate height to which Gothic buildings are liable, giving them something of the majesty and breadth that marked the older system of Greece

Fig. 70. Norman String-course (*c.* 1100)

and Rome united with their own expression of soaring energy. It suggests ideals and aspirations controlled by sound sense in a well-balanced mind.

The Norman string-course was always heavy. In village churches it is usually a square projection with its lower

Fig. 71. Transitional String-course (*c.* 1180)

angle chamfered off (Fig. 70); at Iffley both upper and lower angles are so treated, and the string forms a semi-hexagonal projection; at S. Peter's the square string-course is carved into billets (Fig. 66). In Late Norman work, as in the Cathedral, the angles are rounded off, not chamfered, so that the string is semicircular in section; and in the transition period it is pared away still further to form the 'keel' moulding (Fig. 71).

The next step, which marks the Early Gothic work of

the thirteenth century, is to hollow out the under side of the half-round so that it becomes concave below, convex above. This is an improvement, artistic and con-

FIG. 72. EARLY ENGLISH STRING-COURSE (*c.* 1220)

structional; the dark hollow strengthens the line of the string-course, and the overhanging 'nose' better throws off the wet. It is well seen in the hood-moulds of the lancet windows of Iffley and S. Giles's Churches.

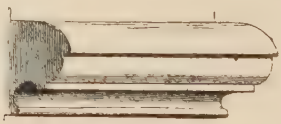


FIG. 73. DECORATED STRING-COURSE (*c.* 1300)

In fourteenth-century mouldings strong contrasts are avoided; black and white gives place to grey shading. So the undercut hollow is abandoned for the scroll-moulding, in which a large convexity above overhangs a smaller one below (Fig. 73); the illustration will make further description unnecessary. The tower-arches of Merton have the scroll-moulding to their hood-moulds.

In the fifteenth century the hollow reappears again, but

it is now wide and shallow ; the upper side of the string-course is often flat or but slightly curved. The drip-stones over the windows of Magdalen Tower are good examples of their type ; similar hood-moulds in the belfry windows of Wood Eaton Church prove the tower to belong to the fifteenth century, though the writers of guide-books, judging only by the form of the tracery, usually declare it to be Decorated in style. It may be said here, and it will be proved later, that the one safe guide to the date of an ancient building is to be found in the character

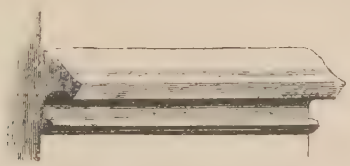


Fig. 74. Perpendicular String-course (*c.* 1450)

of its mouldings. The novice is recommended to approach the study of mouldings by observing the string-courses of the various periods ; each string-course is a single moulding typical of those which will afterwards be found in groups on arches and capitals. The deep, dark cavity of the thirteenth century, the scroll-moulding of the fourteenth, and the shallow hollow of the fifteenth, once familiarized in the drip-stone, will be recognized at once in whatever combination they may subsequently be discovered.

In many buildings, and especially in those belonging to the fourteenth century, the string-course is only represented by the hood-moulds of the windows, and terminates at the springing of the arch in a small carved corbel. The east window (Fig. 88) of S. Giles's Lady

Chapel (*c.* 1260) will serve as an illustration; the drip-stone terminations are examples of a corbel very characteristic of the thirteenth century; from a front view it resembles a buckle, and is often called the buckle-corbel; but seen sideways it has the profile of a human face, and therefore it is also known as the mask-corbel. The hood-moulds of the nave-arches of S. Giles's stop upon bosses of foliage; this form of corbel is often met with in thirteenth-century work, and grotesque carvings are also frequent.

After the thirteenth century, carved heads are very common as terminations to the drip-stones of arches; frequently a crowned head upon one side is balanced by a mitred one on the other, or by the head of a crowned woman. There can be no doubt that these were sometimes portraits of contemporary sovereigns and bishops, e.g. those in the transepts of Merton (Fig. 69); but since the faces of kings and queens could seldom have been familiar to the village carver, they must usually have been purely conventional and imaginary. To those who know the fashion of the head-dress at different periods they often afford valuable evidence as to the date of a building; a still more valuable testimony may be found by the student of heraldry in the shields of arms that are often used in the fifteenth century instead of heads; a head may be imaginary: not so an armorial bearing.[1]

In late work, when art was weary, these carved corbels are seldom found; the hood-mould turns at the springing of the arch as if to continue as a string-course and then stops abruptly. In Tudor work it often terminates in a diamond-shaped panel. In the last years of expiring Gothic, in the sixteenth century, the drip-stone became

[1] At least in the Middle Ages.

a plain square frame over a square window-head, as may be seen in the windows of S. John's (Fig. 96), and in the early seventeenth-century fronts of Wadham, Oriel, and University Colleges; at last it disappeared altogether, and we find the windows of the Old Schools (Fig. 79) as innocent of hood-moulds as those of the Classic buildings which were already superseding Gothic.

The drip-stone was not the only device by which the mediæval builder protected his walls; experience taught him that water in his foundation was as dangerous as, if more subtle, than fire in his roofs, and he learned to take adequate precautions against both. The massive walls of the Norman masons might defy the insidious attacks of damp, but the more economical builders of later days raised their thin walls upon a basement of thicker masonry, and built a projecting course at the level of a few feet above the ground, so that their foundations were completely safeguarded from any possibility of percolation from above. How much protection was thus given to the foundations may be seen by any one who will glance at the basement-course of University College; the projecting coping has been eaten away with rain-drops; yet all that is necessary to restore the wall to its original soundness is to replace this decayed course with new stone; and in the present long vacation, of 1911, this has been done in a part of the building.

Basement-mouldings, which are most common when walls are thinnest, i. e. in the fifteenth century, should be compared with the pedestal-base in the piers of the same period; the correspondence between the projecting course and the overhanging moulding previously referred to is very noticeable.

Artistically, the effect of a basement-course is to give an

appearance of strength and solidity to the substructure of a building; in Classic architecture the effect is obtained by using large stones and emphasizing their mass by means of deep grooves at the joints; the basement or podium of the Camera is so treated, and so are the lower courses of the High Street front of Queen's College (Fig. 81).

The inner faces of mediaeval walls were covered with a thick coat of plaster, which has usually been removed by the modern restorer. In the halls of castles and manor-houses they were hidden by tapestry or arras hung upon a wooden framework a foot or so from the face of the wall. In churches the wall-surface was made to serve as a gigantic canvas on which could be painted incidents of Bible history. Every inch of space was covered with pictorial teaching or painted decoration. All this was covered with whitewash after the Reformation, but in a few churches considerable traces remain. Some further account of the subjects of these frescoes will be given in another chapter.

In very rich work, e. g. in tomb recesses, and in the backs of sedilia, the wall-surface is unplastered, being of finely-jointed masonry, and is enriched with diaper-work, flower-forms sunk in the face of the stone in a chequered pattern. There is much beautiful diapering on the Eleanor Crosses (*c.* 1294), the pattern of which is reproduced in the Martyrs' Memorial. The front of the Wesleyan Chapel in New Inn Hall Street (Mr. C. Bell, 1878) is enriched with similar work.

In the fifteenth century, when walls were usually of ashlar, the sunk panels that enriched their outer faces were sometimes reproduced on their inner; thus in the transepts of Merton the lower part of the wall has panels sunk in its face. The early panels reproduced the tracery

of the windows in blank, but the patterns of late fifteenth-century panelling are much less elaborate.

In Tudor times wooden wainscoting began to be used

Fig. 75. Linen Panelling (*c.* 1500)

instead of tapestry. The walls of New College Hall are lined with oak panelling given by Archbishop Warham, and the wainscot of the Hall at Magdalen dates from the same period, and is said to have come from Reading Abbey. Oak panels of this date are carved with what is

known as the 'linen pattern', so called from its fancied resemblance to the folds in linen cloth. Towards the end of the century wooden panelling came into fashion in all large houses, and even in the churches; there is good Elizabethan panelling at Cumnor, for instance. The panels of this date were small and square, and were uncarved except for a moulding at their edges.

Wooden wainscoting remained in favour all through the seventeenth century, but in the century following it gradually gave place to the new fashion of covering inner walls with paper.

CHAPTER VIII

THE DOORWAY

The main doorway of a church is usually in the south wall, midway in the length of the nave or aisle. This doorway, as a rule, is large and ornamental, and is usually protected by a porch. When it is in an aisle wall it is often of earlier date than the aisle itself, and bears evidence of having been moved from its original position and reinserted farther south when the aisle was added; the Gothic builders seem to have greatly appreciated the fine Norman doorways of earlier times, and we sometimes find one in a church from which every other vestige of Norman work has been swept away.[1]

[1] In such a case an examination of the piers of the chancel arch will sometimes reveal traces of Norman origin, though the arch itself may be much later; the imposts of the chancel arch of S. Peter's (Fig. 55) are a case in point. At Sutton Courtney the old Norman chancel arch has been moved from its original position to the south side of the nave. At Holywell, Headington, and Forest Hill, the chancel arches are all that remain to prove the Norman origin of the buildings. At Radley the font is the only vestige of Norman days.

Fig. 76. South Door, Iffley Church (*c.* 1150)

The Norman doorway now at the west end of S. Ebbe's Church has been moved again and again; its original position no man knoweth; but successive generations of builders had respected it for eight hundred years until it was mutilated in our own times.

Directly opposite the principal opening is another doorway in the north wall; this is usually smaller and plain in character;[1] it seems frequently to have been blocked up after the Reformation; certainly it is the exception to find it in use in village churches. In the Middle Ages it was known as the devil's door—the north side of the churchyard was the devil's province, no old graves will be found in its cold shades—it was opened during the baptism of infants for the convenience of the evil one, who was supposed to follow the unbaptized child to the very font, and not to give up hope until it had been actually admitted into the safety of the fold; then, baffled, he went out into the shadows by means of the door left open for the purpose. This door was also used when the parishioner came to church for the last time; the body entered by it and passed through the building to the graveyard on the south, in token that the way to heaven lies through the church.

In town churches, where mediaeval arrangements have been altered to suit modern convenience, both the doors may be equally used; in some village churches, e.g. Iffley, the north door has become the principal entrance, since most of the village now lies on that side; but that it was not so originally can be seen at once from a comparison between the elaborate ornament on the south door and the plain work of the northern one; the position of the manor-house points the same way.

[1] Cf. the north and south doorways at Cowley, both Norman.

Fig. 77. Thirteenth-century Doorway. Milton (*c.* 1240)

The west doorway was the great ceremonial entrance, only opened for processions or for the admission of dignitaries of Church and State.

Besides the three entrances in the body of the church there was usually a small doorway in the south wall of the chancel for the private use of the priests; the priest's

Fig. 78. Early Fourteenth-century Doorway, Dorchester

door in S. Thomas's Church (Fig. 51) is very interesting because it retains its original ironwork of the thirteenth century.[1]

The Norman doorways were the chief glory of twelfth-century architecture. Their recessed orders,

[1] The ironwork on the door of Merton Hall is also a fine example of a fourteenth-century smith's craftsmanship.

FIG. 79. TOWER OF THE FIVE ORDERS

originally invented under the stress of rude material, and ruder appliances, were developed into such ornamental features that the later builders, as at Iffley (Figs. 11 and 76) actually thickened the lower part of the wall so as to get in an extra order. Two types of Norman doorways

FIG. 80. FIFTEENTH-CENTURY DOORWAY, MERTON COLLEGE CHAPEL, A.D. 1424

may be distinguished, and both are illustrated at Iffley: in one (Fig. 11) the orders are continued round the arch and the sides of the opening; in the other (Fig. 76) the orders of the arch are stopped upon shafts in the jambs. The Norman doorway of S. Peter's Church is of the first

type, and that of the Chapter House shows a combination of the two, the inner orders being continuous from the arch to the floor, the outer ones being provided with shafts. Of the ornaments carved on the orders and capitals we shall treat in a separate chapter.

In the thinner walls of Gothic buildings deeply recessed doorways became impossible. The thirteenth-century builders did, indeed, contrive to give the effect of deep recessing by setting shafts in jambs widely splayed for the purpose, as may be seen in a fine doorway at Milton (Fig. 77); the contemporary builders in France built the marvellous portals of Amiens and Rheims by thickening the wall for the sake of increasing the number of orders; but the English Gothic builders (though their doorways are always beautiful) wisely reduced the number now that their walls were thin, and contented themselves with one or two shafts, or three at the most. These are not detached from the jambs except when they are formed of Purbeck marble, as in the west doorway of S. Helen's Church at Abingdon.

The south entrance to S. Giles's (*c.* 1200) is our best example of an Early Gothic doorway, though it is not to be compared with the contemporary doorways at Milton and Haseley. We have no illustration of a fourteenth-century doorway, but Sir Gilbert Scott's entrance to the north aisle of S. Mary Magdalene is a good copy of one.

There are two beautiful little fourteenth-century doorways with shafts in the south aisle at Dorchester (Fig. 78), but after the Early English period recessed doorways became less common, except in the grander buildings. The capitals of fifteenth-century shafts usually have mouldings instead of foliage; the doorways of Merton Chapel (Fig. 80) and the Divinity School (*c.* 1450)

FIG. 81. QUEEN'S COLLEGE GATEWAY (*c.* 1710

are among the finest examples of the century. In the Perpendicular period the door-arch is almost always set in a square frame, and the triangular spaces in the corners between the arch and the label are filled with sunk panels or shields of arms. This is the form of the great gateways in all the older college buildings; those of All Souls (*c.* 1440), S. John's (*c.* 1437), and Brasenose (*c.* 1509), and the west doorway of Magdalen Chapel are typical.

This form of doorway, minus all its ornaments, and with its arch so depressed that it was almost minus spandrils, remained in fashion until nearly the end of the seventeenth century. The type of doorway seen in Kettel Hall, for instance, or in the Old Schools quadrangle (Fig. 79) was familiar to Elizabeth and all the Stuarts in every manor-house they visited.

In Classic buildings large doorways were built with semicircular heads, like the Gateway of Queen's College or Wyatt's Gateway, Canterbury Quadrangle; smaller doorways are usually lintelled; in neither case was there any splay or recessing of the jambs, the openings, as in Roman work, being cut straight through the wall.

CHAPTER IX

THE WINDOW

THERE are two ways of approaching the study of a language. By the 'direct' method, now coming into favour, the student first acquires a vocabulary and a stock of common phrases, and then, when he has learned to speak the new language, proceeds to study its structure, and to discover the *reason* for the changes in the form of the

same word in different phrases; e.g. he is taught that it is right to say 'Magister puerum docet', but 'Pueri a magistris docentur' before he learns anything of declensions and conjugations; that is, he learns the foreign language as he learned his mother tongue, empirically.

By the older method the pupil began his study with the laws of the structure of the language, with the conjugation of *doceo*, and the declension of *magister*.

This is the scientific method; but science is a late growth in human intellect, the empirical method is now considered the more suitable to infant minds, and the scientific to those more mature.

Until quite lately the study of architecture proceeded upon a system analogous to the 'direct' method in the teaching of language; the student first learned to recognize 'words' and 'phrases'; and naturally the most obvious and everyday words were those to which his attention was earliest directed. So the window, the most conspicuous feature in an ancient building, was the feature with which he made the acquaintance of architecture, and in all his subsequent study, it was to the windows that he would first turn his attention in visiting a new building.

Unfortunately for the method the student, as a rule, never got beyond the vocabulary stage, never proceeded to the study of relationships, to what we have called the grammar of architecture.[1] Most students of history can give the approximate date of a mediaeval door or window, but how many can give the etymology of its form? can trace its relationships to building science as a whole? A study in which there is no progress, which provides

[1] There is the same danger besetting the new language-teaching: but that is by the way.

no exercise for the reasoning powers, is mere dilettantism, of no more value than the smattering of French phrases with which the 'higher grade school' child rejoices the heart of his innocent parent.

But I trust that it will have been clear to the reader from the first that the scientific method is the true approach to architecture, and that he will not be surprised to find a chapter on windows at the end instead of at the beginning of this section of the book.

The window, though a very conspicuous and beautiful feature, is not one of the fundamentals of architecture; it is a comparatively modern accessory and convenience. There were, and there are, no windows in primitive buildings, in the beehive hut of the Zulu, or the conical wigwam of the Indian; there were none in the temples of Egypt and Greece; even in the buildings of luxurious Rome, more light entered from the doorway than from any other source, and open skylights were far more common than windows.

The window (wind-eye), as the first part of its name implies, seems to have had its origin in apertures pierced in the wall for the sake of ventilation; such are found in the ruined temples of Egypt and Greece. In Roman buildings they were so placed as to let in a certain amount of light as well as air; in the early Romanesque churches they were still unglazed, and admitted much more air than light; and it was not until Norman was passing into Gothic that the second syllable of the word became first in significance.

Windows may therefore be said to be a Gothic development; they are one of the *ideas* inherited by the Gothic architects and developed by them from germ to perfect organism.

In discussing Saxon windows and, indeed, Saxon work in general, one needs to walk very warily on ground that is yet far from firm. It would be expected *a priori*, that these early windows would be very small, and most of them are so, being often cut through a single stone; even when the whole window is not so formed the round head is simply a semicircle cut out of one stone, and is therefore not a true arch; but the heads of many Early Norman windows, and even of small lancets, were often formed in this way, so that the method is no evidence of pre-Conquest work. Again, not a few windows which are generally supposed to belong to Saxon times are fairly large, like those in S. Michael's tower (Fig. 10).

However, it is no part of our present duty to go into a partially explored country; the reader may be left to do so on his own account. I will keep within safe limits by saying that some of the windows in Saxon buildings had the characteristics of those in S. Michael's tower.

Two types are there represented, belfry windows and others, in which some semi-translucent material could be inserted to take at least the edge off the wind. The first type forms one of the few unmistakable features that may always be assigned to Saxon craftsmen. The opening is not recessed, but is cut square through the wall in the Roman manner; the difficulties of so constructing a large arch are overcome by substituting two small ones, which meet in the middle on a common impost formed by a long stone that runs right through the wall, and is carried by a stone post called a baluster shaft. This very characteristic shaft was made by turning in a lathe, exactly as the leg of a table is turned—indeed, its resemblance to a stout table-leg is very marked.

We have seen that the greater number of Saxon

churches were rebuilt after the Conquest ; no doubt the old material was used again, but there seems to have been so little carved stonework in the buildings that there is usually nothing by which it can be identified as having formed part of an earlier church. The one exception is the turned shaft, and these were often used again by the Norman builders. One such shaft may be seen in a clear-story window in the south transept of the Cathedral.

The lower windows of S. Michael's tower probably represent the type that lighted the original nave and chancel. The round arches of their heads are clumsily formed of rubble ; the openings contract in the middle of the wall and widen out towards both its exterior and interior faces, so that, whether looked at from within or from without, the windows present a 'splayed ' or funnel-like opening. Glass was not unknown in Saxon times, but it must have been extremely rare in parish churches. A wooden frame on which parchment was stretched, or even a wooden or wicker lattice, was probably the usual light-transmitting medium ; this was placed in the medial opening, where it would be protected by the deep splay of the jambs.

One other type of window-opening, though not represented in S. Michael's, was common in Saxon buildings. The head was gable-shaped, formed by two long flat stones which met at an angle. Small windows of this sort may often be seen in the walls of barns. In the nave of Bicester Church there is a large triangular-headed opening in the north wall which seems to have been the doorway of a Saxon church. The tower of Caversfield Church near Bicester is certainly Saxon, with very characteristic windows.

Norman windows are better constructed than any of those in S. Michael's tower, their arches and jambs being formed of squared stones. The glass is set near the outer

FIG. 82. NORMAN WINDOW, SANDFORD (*c.* 1100)

face of the wall, and here the opening is very small, for glass was dear and times unsettled. A wide interior splay through the thick wall allows the light to spread inwards. At first the windows were without ornament both within

and without, but in an early window (Fig. 82) at Sandford (*c.* 1100) rude shafts are set in the jambs to carry the outer order of the arch; twelfth-century windows were often enriched in this way; those in the west front at Iffley (Fig. 11) have shafts in the jambs outside, while those in S. Peter's Church (Figs. 31 and 66) have shafts both within

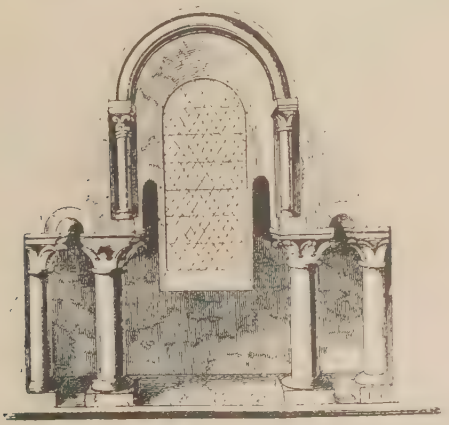


Fig. 83. Late Norman Window, Cathedral (*c.* 1186)

and without, some of them elaborately carved. In the windows of the north and south walls of Iffley and the chancel at Cassington the recessed orders, like those of the Iffley west doorway, have no shafts, but are enriched with carved chevrons or a bold semicircular moulding. A comparison of the west windows of Iffley with those on the north and south will show that plain windows were often built in Late Norman work, and are therefore no proof of date; Cassington windows are very plain,

but the fact that the jambs are moulded proves that they are late in the style. Late Norman windows are usually long and narrow, approaching the lancet type in their proportions.

In the latter half of the twelfth century circular windows were occasionally constructed in the western gables of churches (Fig. 11); that at Iffley is a modern

Fig. 84. Late Norman Window, Sutton (*c.* 1170)

restoration, but is believed to be faithful to the original design. The east end of the Cathedral chancel is also a restoration (Fig. 13), but is much more conjectural. However, its wheel window with its radiating members will serve as an illustration of a beautiful type that came into existence in the reign of Henry II.

In the arcade of interlacing Norman arches in the south wall of S. Peter's Church (Fig. 66) lancets are formed at each point of intersection. In the tower at Sutton Courtney (Fig. 84) lancets so produced are pierced and

glazed so as to form what are probably the earliest lancet-windows in England.

Exterior Interior

FIG. 85. LANCET WINDOW (*c.* 1220)

By the end of the twelfth century the lancet type had become everywhere common, and singly or in combinations it prevailed for half a century ; indeed, it may be said to

have dominated the form of the window all through the Middle Ages, for its long narrow proportions were maintained in the window-lights whatever might be the shape of the composition as a whole.

The range of windows in the south aisle of S. Giles's Church (*c.* 1200) affords an excellent illustration of the early lancet, long, narrow, plain both within and without, its glass set near the outer face of the wall, and inside, a wide splay to allow the light to spread. Other good examples may be seen in the Lady Chapel of S. Peter's, at Elsfield, and Wood Eaton.

The Norman practice of supporting the arch upon shafts in the jambs was continued, to the greater beauty of the window, as may be seen by comparing the plain early lancets of the south aisle of S. Giles's with those on the north side, which are twenty years later (Fig. 14). There, too, will be seen a further development in the arrangement of windows: the lancets are set in groups; outside they appear as separate windows, but inside the jambs are so sloped that a pair or a triplet of lancets forms one composition. Yet even outside there is evidence of a new grouping principle which was destined to produce most wonderful results: the eastern lancets are completely independent; but those on the north, though each is distinct, are arranged in groups of two or three, each group being covered by a hood-mould common to the members of the group.

By far the finest group of lancets in Oxford is that in the east window of the Chapter House;[1] I use the singular number because most people see the Chapter House from

[1] The effect is rather spoiled by the transoms inserted in the seventeenth century for the purpose of making casement-openings in the lower part of the lights.

within, where the group appears as a single composition ; but if the east end is seen from the Canons' Gardens, each of the five lancets appears as a separate window ; close inspection, however, reveals even externally a suggestion of unity in a relieving arch built into the wall above the heads of the lights.

Every detail of the beautiful composition within will repay the minutest study. The mere ornaments will be examined later on, but the general scheme by which five windows are unified into a single whole calls for immediate notice. It will be seen that the end is accomplished by means of shafts ; these are not placed in the jambs, but support an inner range of arches in the same plane with the inside face of the wall ; it is *their* unity which gives unity to the whole window ; they give it besides such grace and lightness that the gap in the massive wall becomes a prism of illuminated air.

This beautiful arrangement marks most of the best lancet-work ; it may be seen in the windows of S. Giles's north aisle, and in those of the Cathedral spire ; it was never completely abandoned by Gothic architects even when they had discovered a new method of 'composing' a window, but it ceased to be common after the reign of Henry III.

The next step forward, which was taken towards the middle of the thirteenth century, seems to have been anticipated by the builders of S. Giles's tower. Even before the building of the north aisle, the tower-makers had grouped two lancets together under one arched hood-mould ; but they had been annoyed by the blank space left between the heads of the lancets and the over-arch, and so they pierced it with another small lancet. In this they proved themselves pioneers ; the aisle-builders

twenty years later accepted their suggestion, and in one of their lancet groups they, too, pierced the space between the hood-mould and its pair of lancets. But they improved upon their model, and instead of a third lancet they made

Fig. 80. The Germ of Tracery, S. Giles's (c. 1200)

a small circular opening. Oxford University was then in its early years; had it numbered among its members a sufficiently able theorist, he might have foretold from this north-western window of S. Giles's the form of the east window of Merton Chapel—and have lived to see

his prophecy fulfilled. For this window and similar ones in the spire and belfry of the Cathedral tower (Fig. 27) mark the conception of a new idea in architecture, the idea of *tracery* in the window-openings. From Late

Fig. 87. Early Tracery, Woodstock (*c.* 1240)

Norman times the builders had been feeling after beauty as well as light in the window, and now they had discovered a new principle of beauty. The Norman architect had beautified the form by which the light entered: the Early Gothic builder had improved upon that form.

Now, in the second quarter of the thirteenth century, light was let in, not by one beautiful form of opening, but by a group of such. The history of windows for the next hundred years is the history of the invention of

Fig. 88. Early Tracery, S. Giles's (*c.* 1265)

beautiful forms which could be combined in an opening to admit light.

The first experiments were made by piercing the space above the heads of a pair of lancets; such compositions mark the work of the first half of the century. The simple circle was soon improved upon, and a quatrefoil took its place, as in the windows of the Cathedral spire. Other

geometrical forms were also used: there are interesting examples in the towers of Harwell and Brize Norton. Then the builder began to experiment in the space between three lancets and their hood-mould.

Here a single piercing was not enough; the space must be filled by a combination of apertures. We find the solution of the problem in the east window of the Lady Chapel of S. Giles's (*c.* 1265); three circular openings are pierced in the triangle between the heads of the lancets and the arch above. I say 'pierced', but as they so completely fill the space that there is no longer any suggestion of walling in the head of the window, it would be more true to say that in the void above the lights three rings of stone have been inserted. And that is most probably the method by which the window was formed; a large opening was cut, and three lancets with the circles above them were built up inside it of bars of stone. That certainly is the method adopted in all windows after the middle of the thirteenth century. It is the converse of the lancet system of window composition: there separate apertures are grouped to form one window; here a single aperture is divided into variously shaped parts by means of a framework of stone bars fitted into it; if we may apply to concrete processes the terms descriptive of mental operations we might say that the one method was synthetic, the other analytic; in the progress of window-making, as in that of science, that is the natural order of things.

Tracery

The combinations of openings in the head of a window form what is known as Tracery. The early forms,

produced by piercing the wall, have been called Plate-tracery; pierced tracery would perhaps be more expressive. The patterns formed by curved bars are usually

FIG. 89. GEOMETRICAL TRACERY, MERTON COLLEGE CHAPEL (*c.* 1297)

termed Bar-tracery; one might suggest inserted tracery as an alternative phrase.

Plate-tracery, as we have seen, lasted but for a generation in England, and was then improved out of existence.

The French, however, continued to develop perforated

Fig. 90. Very Early Bar-tracery, Northmoor Church
(*c.* 1270)

tracery long after the English had left it behind in their progress towards the perfect window. Some idea of their late plate-tracery may be gathered from the windows in the modern church of S. Frideswide, and from those in the Congregational Chapel on the Cowley Road.

Up to this point the development of architecture had gone on *pari passu* in the countries of Western Europe (Fig. 25), but now, as the nations found their individuality, the national styles diverged.

In the early bar-tracery of the second half of the thirteenth century the simple geometrical forms of the older type were retained, the arches of the windows being filled with trefoils, quatrefoils, and curvilinear triangles of varying proportions and combinations.[1] The plain heads of the lights were also enriched by the insertion of two curved projections called cusps, which gave a trefoil form to the top of the lancet, and made it more harmonious with the tracery above. The early cusps were separate ornaments fitted into the under-side (or soffit) of the arch, like those in the heads of the lights in the east windows of S. Giles's Chapel and the chancel at Hampton Poyle; but towards the end of the century the arches of the lancets were made in the form of a trefoil and the cusps ceased to be independent; after the end of the Lancet period the cusps increased in number, so that the head of the light became a cinquefoil. The late lancets in the chancels of Stanton S. John and Piddington are good illustrations of the improved method; and the one old window in the tower of Carfax shows, by its trefoiled head, that it too belongs to this period.

[1] This is the 'geometrical' tracery of Sharpe, who seems to have supposed that the more complicated 'curvilinear' designs were drawn free-hand.

The windows of Merton Choir, built at the end of the thirteenth century, are among the most beautiful examples in existence of geometrical tracery; the lower window

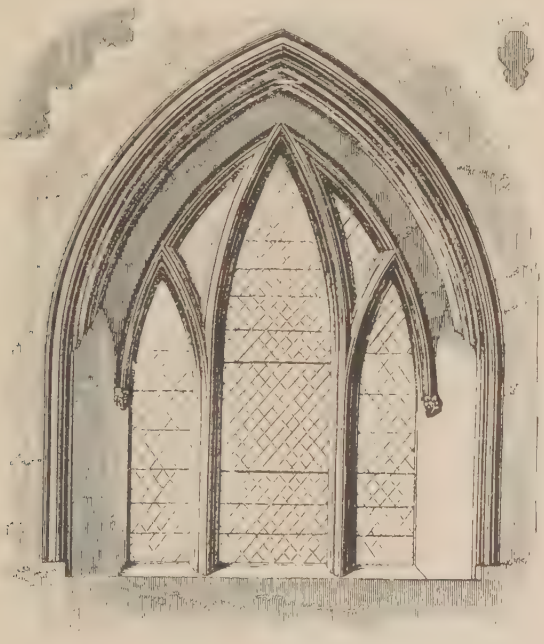


FIG. 91. WINDOW, S. MICHAEL'S (*c.* 1260)

in the northern face of S. Mary's tower is hardly less beautiful; and, if the eye is not satisfied with seeing, one can go to Haseley for further gratification, or to Lewknor and Chinnor, which are only a little farther on.

Or one can take a shorter journey and visit the north aisle of S. Mary Magdalene, where Sir Gilbert Scott has reproduced the tracery of those churches. Some people may similarly spare themselves a journey to Northmoor by studying the clear-story windows of the Cowley Fathers' Church, where a most interesting form of early tracery (Fig. 75) has been copied by Mr. Bodley. The windows of the north choir-aisle at Dorchester are also very early examples of the new development.

But not all windows of the age of Wallace and Bruce were decorated with tracery. The single lancet with trefoiled head still held its own, as at Stanton S. John; and many windows were simply divided into three lights by plain mullions without tracery; the east window of S. Giles's and the south window of S. Michael's (Fig. 91) are examples of a composition very common in parish churches in the days of Edward I. A very similar window may be seen in the upper story of S. Mary's tower (*c.* 1280); but here the mullions interlace in the head of the window. When the heads of the lights and the spaces above them are foliated with cusps, as at Dorchester, this simple design produces a very beautiful window.

CHAPTER X

THE WINDOW (CONTINUED)

Beautiful as are the windows of Merton the vigorous 'Gothic' mind was not satisfied with one solution of the problem; the geometric method of producing a perfect window was too easy, it needed but to group geometrical figures in various combinations and to select the most beautiful that presented itself. So now the artist-builder

began to conceive new designs not suggested by the simpler geometrical forms, and to plan intricate and sinuous curves by combining parts of many circles. Thus, in the early years of the fourteenth century, a new form of tracery beautified the windows, formed of free-flowing curves, and hence known as the 'flowing' or 'curvilinear' type; the latter term, invented by Sharpe, has become conventional: but, of course, geometrical tracery is formed by curved lines, and curvilinear tracery by geometrical curves.

The invention of flowing tracery completed the unification of the parts of the window; in the geometrical period the lights and the traceried head had been distinct portions; now the mullions flowed into the tracery, and the ogee curves in the heads of the lights were continued in those of the design above. It was the discovery (or rather the re-discovery) of the ogee curve that brought the new tracery into being.

Our Oxford examples in the Latin Chapel and the north aisle of S. Peter's are not among the earlier or finer designs to be found in England; they probably belong to a date when the war with France was beginning to fill the minds of Englishmen with ideas of plunder and self-aggrandizement ill-suited to the progress of art. The most beautiful flowing tracery belongs to the reign of Edward II, when it and geometrical tracery were used side by side, as at Milton. Witney, Chipping Norton, Broughton, Adderbury, and Bloxham, have finer examples than any in Oxford itself.[1]

The beauty of a flower is greatest on the day before it withers. The new method, at first invented to produce

[1] The most beautiful windows in England are the east windows of Carlisle and Selby and the west window at York.

more intricate and subtle curves in the window-tracery, was soon seized upon as a means of producing a design without the labour of conceiving it. A very graceful

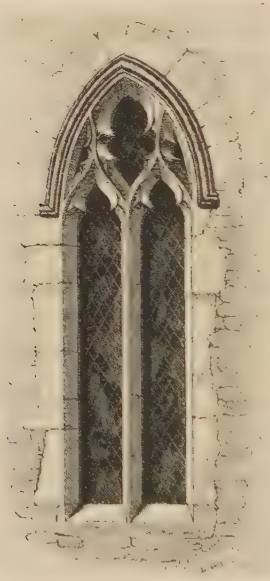


Fig. 92. S. Michael's (*c.* 1320)

undulatory curve marks all the flowing tracery of the fourteenth century, and it had been used to produce a design for a two-light window (Fig. 92) that was the most beautiful small window of the Middle Ages; it is the form of the south-west window in S. Peter's. This

design was now taken as a unit for a large window, and was simply repeated to form a pattern ; so was produced the type of window (Fig. 93) seen in the vestry of Merton

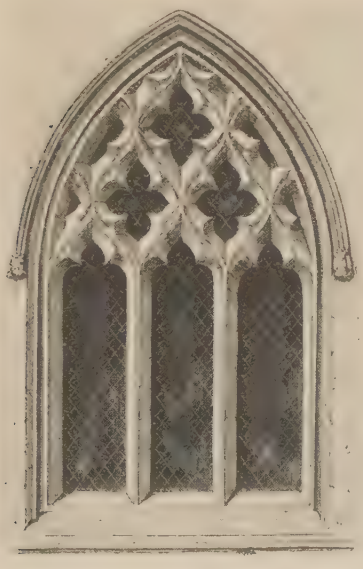


FIG. 93. S. MARY MAGDALENE (*c.* 1337)

(*c.* 1310) and the south aisles of S. Mary Magdalene and S. Aldate's ; the tracery is a mere network formed by the repetition of a single form, and is therefore known as reticulated tracery. It marks the beginning of the end ; it is the first symptom of paralysis of the Gothic mind.

What, then, shall we say of the petrified cabbage-net that does duty for an east window in the modern church of S. Peter-le-Bailey ?

We saw that tracery had its origin in the desire to beautify the forms of the openings by which the light was admitted ; in flowing tracery this idea had been insensibly abandoned ; it was no longer the openings on which the mind of the artist was centred, but the curve and flow of the bars themselves. By the middle of the century all regard for the form of the openings had been lost, and we have tracery like that in the west window of S. Mary Magdalene, in which the bars twist and writhe in the sinuous curves of leaping flames, while the openings between them are mere formless voids.

This was a grave and significant error. It marks the breaking away from the great Gothic principle that the artistic design should express the purpose of the construction ; it means the sacrifice of use to a false idea of beauty. The structural functions of tracery are to furnish openings which may be glazed to admit light, to provide a frame for the glass, and to give support to the arch of the window : it is at once obvious from an inspection of the example mentioned that the new 'flamboyant' type of tracery fulfilled satisfactorily none of these purposes. Its reign was, therefore, very brief, not because the architect repented him of his error, but because he was ceasing to be the master craftsman ; his supremacy over mediaeval art was being challenged by another artist, the glass-maker ; and soon he was to be made servant where he had been master, and the form of his work was to be dictated to him by the requirements of the new industry.

We have spoken of the walls as a pictorial Bible ; the glass-makers had for centuries been trying to emulate

in their windows the paintings of the walls. Even in Norman times some beginning had been made in the great abbeys to manufacture coloured glass. In the thirteenth century rude figures of the saints, pieced together of coloured fragments, were set in the openings of the tracery even in village churches. But they were small and crude, and they obstructed the light. The examples in the lights of Merton Choir windows will be familiar to every one; they are intensely interesting, and to some people beautiful. The glass in the windows of the Latin Chapel and S. Lucy's Chapel in the Cathedral belongs, like the tracery, to the time of Crécy and Poitiers—the date of the Becket window, at least, cannot be earlier than 13 Edward III, in which year the king marshalled on his shield the lilies of France in addition to his own leopards; and since the French arms are borne on a separate shield and not quartered with England, it is probable that the glass is not much later than the year of their assumption.

The figures in these windows are still small and crude. But the Oxford glass-makers were behind the times. The craftsmen at Gloucester were already composing larger and more life-like figures in fine clear glass, and had, moreover, discovered the secret of making glass of a silvery whiteness to form a background for their pictures. The monks of Gloucester were just then preparing to rebuild their choir with funds provided by the offerings of pilgrims at the shrine of the unfortunate martyr Edward II, and they were naturally anxious to take advantage of the recent discoveries in pictorial glazing in the windows of the new work.

Now that larger figures could be made, larger windows were possible: so the new windows must be made wider. But their wide arches would need more support from

the tracery: and the weight-carrying bars in the tracery are the upright mullions between the lights; these must therefore be carried right up to the head of the window to support the arch. Then what became of the curves and circles in the top of the window? Obviously their day was over.

So reasoned the architect. But the glass-maker arrived at the same conclusion by a different line of reasoning. He was able and anxious to turn the window into a picture, but for the success of his composition it was essential that the irregularly shaped, variously sized, and diversely disposed openings should be modified to form a framework for the insertion of his figures. Imagine the despair of an artist who was required to fill the radiating sectors of a wheel-window with full-length figures of the apostles.

Therefore in the new work at Gloucester, begun in 1337, was evolved a new type of tracery in which neither the form of the aperture nor the curves of the bars, but the composition of the stained-glass picture was the predominant *motif*. Great windows, fifteen or twenty feet in width, and twice as high, are divided into rectangular compartments, each forming a frame for one of the figures composing a complete window-picture. In the lower part of the window ten or twelve long panels contain figures almost of life-size; above them, tier upon tier, are ranges of smaller panels, each containing a proportionate painting. I say panels because the openings have ceased to be lights; the figures, indeed, are set in a background of white glass, and the huge windows efficiently illuminate the building, but one feels them to be glass pictures rather than windows. Between each tier of panels a horizontal bar of stonework crosses the window from jamb to jamb. It is known as a transom, and its

purpose is to give, both in appearance and in reality, coherence and strength to the framework.

Seen from without the effect of this form of tracery is that of a stone gridiron. As such it forms the gravamen

FIG. 94. S. PETER'S IN THE EAST (*c.* 1360)

of Ruskin's charge of degeneracy in the fifteenth-century architect; but, indeed, he might as reasonably have arraigned the gridiron itself for not being a cutlet. The truth is that window, as in the modern sense, now meant the glass and not the framework; tracery, in the

true meaning of the word, may be said to have come to an end in the fourteenth century. Henceforward window-making ceases to be the province of the architect : he has

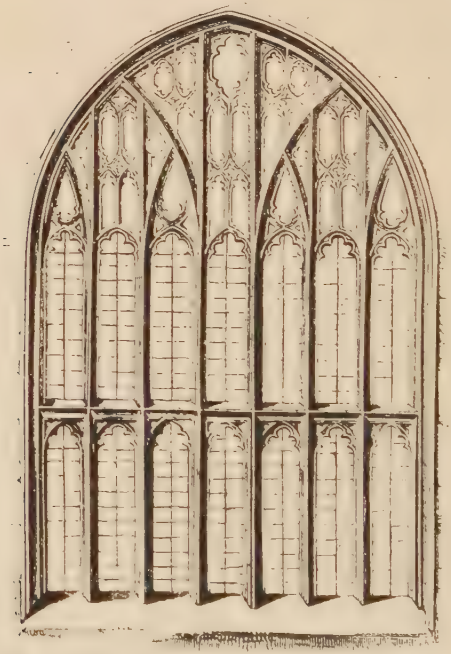


FIG. 95. FIFTEENTH-CENTURY WINDOW, S. MARY'S

simply to provide a frame for the real window-artist. In the windows of New College Chapel (Fig. 16), and in every window filled with good glass, no one notices the form of the stonework : the more it challenges attention, the less it befits its purpose as setting for the picture.

It is now that the picture has been reft from the frame that the latter appears as a window; as a design for light-openings no excuse can be made for it, but it was never intended, and ought not to be judged, as such.[1]

For fifty years and more the old deeply-rooted conception of a window as a beautiful opening caused the English builders to resist the example of Gloucester. The results of the Black Death and of the failure of the war, and the mental paralysis of Church and State caused by the astounding demands of the labourers for a living wage and an uncorrupt priesthood, also checked the progress of architecture for a whole generation. Yet the trace of the new influence can be seen in short vertical members inserted to strengthen the flowing tracery after the middle of the century; such indications of the coming change may be observed in one of the windows of S. Peter's north aisle (Fig. 94), in the Becket window of the Lucy Chapel, and in the curious tracery of the two-light window in the south aisle of S. Giles's Church.

However, when William of Wykeham planned his new college in 1380, his adoption throughout of the rectangular type gave the *coup de grâce* to curvilinear tracery.

In the next century Wykeham's glass and its concomitant *grille* came everywhere into fashion; hence the term Perpendicular is commonly used to denote the manner of fifteenth-century work. It is a happier term than many of those invented by the Gothic revivalists, since rectangularity is a well-marked characteristic, not only of the windows, but of the wall-panels, the doorways, and most of the ornamental features as well.

[1] Even so, the fourteenth-century tracery in the Sanctuary at Dorchester is far uglier, now that its glass is gone, than the frankly-confessed panels of the fifteenth century.

CHAPTER XI

THE WINDOW (CONCLUDED)

Such was the enthusiasm for the new glass that small early windows were often pulled out in order that a building might be lightened and beautified by its means. Five Norman windows were thus sacrificed at Iffley, including the circular window now restored to its original form. The shield of Pole impaling the royal arms in the glass of the south-west window suggests that these windows date from the time of John de la Pole, Duke of Suffolk (1463–91), who married Elizabeth of York.

The depressed arches of the wide fifteenth-century windows gave so little room in the heads that the builders were forced to make the tracery encroach upon the space below; therefore, in many examples, the windows of the Divinity School for instance (Fig. 17), the large lights do not rise to the level from which the arch springs; and, since the tracery descends below that level, it is sometimes spoken of as 'dropped' tracery.

Though the stonework of the window had suffered, as an artistic conception, yet there remains much to admire in the scientific disposition of the mullions, especially in the earlier work of the fifteenth century. The windows of New College Chapel are good illustrations; there are sub-arches in the tracery to lessen the thrusts of the great containing arch; and the thickness of the mullions is nicely graduated according to the weight of the burden they carry; their form also should be compared with that of earlier mullions; it will be seen that their diamond-shaped section, narrow and deep, gives a minimum of

surface to wind-pressure with a maximum of strength to resist it.

I shall have failed in my main purpose if the reader has not realized that down to the point at which we have now arrived there was a continuous progress in the construction of every architectural detail. In the twelfth and thirteenth centuries especially, development had been so regular that it is almost possible to distinguish the work of any decade from that of the corresponding period before and after. But after 1400 there is a slowing down; change there must have been, but it was so gradual as to be almost imperceptible—the years of growth were over. There is, for instance, little in the form of a window of 1410, by which it can be distinguished from one of 1480. The windows of S. Mary's are a whole hundred years later than those of New College, but there is so little difference to show for that century that one might be pardoned for thinking them contemporaneous; so the belfry stories of the towers of Magdalen and Merton differ in date by more than half a century, but it would need a very expert critic to declare from inspection which was the earlier. Knowledge of construction alone, after 1400, is insufficient to enable us to do more than assign a building to some date in the fifteenth century. To date it more definitely we have to turn for help to other branches of archaeology, and especially to heraldry, to the study of which all serious students of architecture must eventually come. For heraldry, like architecture itself, is one of the tongues of history, and their stories are often complementary—the one telling the date of a building, the other the names of the builders. And where, as often in the fifteenth century, the architectural evidence is indefinite, some shield of arms carved in a boss or spandrel,

or emblazoned in a stained-glass window, will fix the date as well as suggest the founder.

For a century, then, the form of the window changed but little.

Then came the great earthquake of the Reformation ; and when the black night of confusion and wreckage was over, the dawn rose upon a transformed world. Every prospect was changed; man had to adapt himself to a new mental environment.

It is usually said of church organization and church architecture alike that they were hopelessly corrupt and degenerate in root and branch, and that nothing short of a cataclysm would have been sufficient to clear the ground for better things. That question cannot be argued here. But whatever may be thought of the Church, it is certain that architecture never recovered from the blow ; religion went out of it ; it ceased to appeal to the spiritual part of man ; and materialism entered into it ; instead of desire for beauty it proclaims the desire for comfort ; and instead of the pride of the artist in his work it reflects the pride of the paymaster in his possessions ; its message is no longer ' rejoice with me ', but ' envy me '.

As in the Middle Ages there had been but one type of window, the church window, so after the Reformation there was one type, the house window ; it is the distinguishing feature of the ' domestic Gothic ' which is the one architectural product of the following century. We have seen that all through the Gothic period there was a steady improvement in the lighting of churches, which may or may not have been accompanied by corresponding development in the outlook of men. But at the date of the Reformation many of the older churches were

FIG. 96. JACOBEAN WINDOWS, S. JOHN'S COLLEGE

still insufficiently lighted by their original windows; and now that the Bible and the Service Book had been put into the hands of the congregation, such mediaeval darkness must be dissipated; hence the insertion of domestic windows in the walls of so many of our old churches; they were not needed in the churches in Oxford itself, but Marston, Cowley, Noke, Wood Eaton, Hinksey, Binsey, and many other village churches in the near neighbourhood have 'Reformation windows' in their ancient walls.

Almost every college possesses a wing or a block of rooms added at this time; some colleges, like Wadham, Jesus, University, and S. John's, were wholly built or rebuilt in the domestic Gothic style; the window of that period is therefore by far the commonest Oxford type (Fig. 96). There must be hundreds upon hundreds of examples, all practically identical in the form of their lights. In the small private rooms a two-light window is usual, just two oblong apertures divided by a mullion and framed in a plain square label; in the large rooms a window is formed by combining six or eight lights in a double row; this form of window is intermediate between the great Perpendicular windows and the modern glazed trellis.

No one can see the Garden Front of S. John's or the Fellows' Buildings at Merton without admitting that the Late Gothic builders did evolve a form of window perfectly suited to domestic requirements; it is when one sees it in a church that one feels that there is something wrong about it. What that is becomes clear in the light of the rather difficult parable of the man who had no wedding garment. I find that the window and the parable help to explain one another.

FIG. 97. COWLEY CHURCH

The Jacobean builders seem to have felt that the dignity of the House of God demanded a nobler form of window than the domestic type, and they made an effort to revive the arched and traceried opening. In the windows of Wadham Chapel they were so successful in imitating older designs that the work can scarcely be distinguished from that of two centuries before. But where they tried to design forms of tracery for themselves, as in the chapels of Lincoln, University, and Oriel, the results compare badly with the earlier work (Fig. 19).

In the examples given a new form will be noticed in the tracery—that of the ellipse. The mediaeval workman never seems to have mastered the difficulties of ellipse construction. It would have helped him to a solution of the vaulting problem, as may be seen by an examination of the sham vault of S. Andrew's; but though this was realized, it was tried only in one or two buildings, and was soon abandoned in favour of the other solution.

One delightful window must be mentioned as a product of Tudor architecture—the oriel, a bay window built out upon corbels so as to give a view on all sides. The beautiful oriel in Christ Church Hall and the still finer one at Magdalen are among the finest examples.

The mullioned window, essentially a Gothic invention, and perhaps its latest structural achievement, was also the last Gothic form to survive.[1] But by the middle of the seventeenth century all the other Gothic forms were extinct, and before the century was out the mullioned window followed them in to the limbo of antiquated things. The last examples in Oxford are the windows

[1] Indeed, it may be said never to have perished, for it was retained in humble buildings even in the eighteenth century.

of the Old Ashmolean, built by Wren in 1682. But these, like the strange windows in the belfry of All Saints' Church (Fig. 22), are so exceptional that they must be regarded rather as revivals than survivals, as atavisms produced by the effect of a Gothic environment on the mind of the builder.

With the rise of the professional architect in the person of Inigo Jones, the Gothic building with Classic details gave way to the purely Classic type. But since the ancients had but few and small openings for light in the walls, and had therefore left no models, the Renaissance architects were forced to invent a form of window in harmony with the Classic styles. This was done by the earliest of them, Palladio and his school of the Italian Renaissance, and the results formed the models of the English architects.

There are two types of Palladian windows, one having an arched, the other a lintelled head. Both are so plain that only a short description will be necessary. They are simply square or arched openings cut straight through the wall without any splay or recesses in the jambs.

In the arched window the keystone in the crown is usually distinguished by carving, and by being made to project beyond the other voussoirs of the arch; the windows of the Sheldonian Theatre (Fig. 5) are good examples. The square-headed type has sometimes a low stone pediment projecting over it, as in the windows of the Old Ashmolean. The east front of Worcester College, built in the latter half of the eighteenth century, shows a combination of the two types; a central arched opening is flanked by two square-headed ones; the result is sometimes known as a Venetian window. Those in the end walls of Christ Church Library are fine examples.

The projecting sill is an eighteenth-century addition to the window-opening; the bottom of the Gothic window was splayed like the jambs.

The sliding wooden frame or sash came into use late in the seventeenth century; the mediaeval window, or that part of it made to open, swung outwards on its hinges like a door. In the eighteenth century many of the casement windows in the older colleges were fitted with sashes; in some the mullions were cut out entirely: in others, e.g. at Lincoln and Wadham, the inner half of the mullion was cut away and the sash fitted in behind it; the latter is a favourite device of the modern builder, except that he builds a sashed window first and then claps a half-mullion in front to 'Gothicize' it. There is a difference, too, between mutilating an old window for purposes of modern convenience and building a mutilated obsolete form as an original design.

Modern windows exhibit a chaos of ancient types, the predominant one being the oblong sashed opening of the eighteenth century. But every age, from Early Norman to Late Renaissance, is represented in our modern buildings. We have Early Norman windows in the new Roman Catholic Church, late ones in S. Clement's, early thirteenth-century lancets in Holy Trinity Church, plate-tracery in S. Frideswide's, early geometrical windows in the new church at Summertown, late geometrical in Mansfield College Chapel, flowing tracery in the windows of the chapel of Manchester College, and Perpendicular in those of the church at New Hinksey. Then we have domestic Gothic windows in the New Schools, and Palladian windows in the front of Hertford College. And lest any ancient type should fail of representation, we have plate-tracery of the French type in the windows

of the Congregational Chapel, and Venetian Gothic in those of the Museum.

But the typical modern window is the square hole in the wall, through which most of us look out on the world.

CHAPTER XII

ARCHITECTURAL ORNAMENT

With this chapter we bring to a close the long analysis of mediaeval building construction that forms the principal section of the book. It is possible that some readers will have found the conclusions suggested by the evolutionary method at variance with their preconceived notions of the origins of architectural forms; they may object that in our search for reason in architecture we have overlooked the symbolical meaning which is commonly supposed to be hidden in the details of a mediaeval church. The truth is that the symbolism usually read into features of Gothic architecture has no real existence; it is purely imaginary and sometimes fantastic to the point of absurdity. Symbolism there is, or rather an inward and spiritual meaning beneath the outward forms, but it lies too deep for the dabbler; conscious symbolism does not exist at all in Gothic construction; for the forms of the fundamental parts of a building are governed by their inter-relations and not by caprice; it is because architectural details are so often studied in isolation that misconceptions arise and are perpetuated. It probably never entered the mind of the designer of the Cathedral that the plan of his church was that of the Cross, upon which the world was redeemed:[1] to him it was the most

[1] Moreover, the Cross of Calvary was probably a Tau.

convenient and scientific disposition of the parts of his building. So in his three stories he had no more thought of the number of Persons in the Trinity than had the designer of the triple lancets in the east end of S. Giles's Church ; a single light was not sufficient ; a pair, occurring as it did in the aisle walls, would not give adequate dignity to the eastern front ; therefore he composed a triplet of lights. But if his building had been a finer one he would have built five instead of three : what is the suggested symbolism of the number five ?

Where intentional symbolism exists at all it must be sought for in the carved ornament, in which alone the fancy of the builder had free play. No one that has seen the carved misericords of fifteenth-century stalls can deny that there is, in many of the figures represented, an intended symbolical meaning, more often than not an old familiar Biblical one, as, for example, that of the vine and its branches ; Mr. Bond has suggested that the grotesque figures, such as are sometimes carved on corbels and gargoyles, may sometimes be symbolical—perhaps of the divine power to turn evil and ugly things to good and beautiful ends. Many of them, however, merely reflect the spirit of fun in the workman ; often, as at Cumnor, they look very much like caricatures.

But to assert, for instance, that the carved oak-leaves on S. Frideswide's shrine were intended to suggest her sojourn among the acorn-eating pigs is to give ground for the suspicion that one's acquaintance with fourteenth-century art is limited to the examples in Oxford Cathedral ; the oak-leaf, the most typical leaf of our woods, is represented in every church where naturalistic foliage occurs. If oak-leaves refer to S. Frideswide's history in one place, what do they mean in another ?

Fig. 98. Ruined Shrine of S. Frideswide (*c.* 1289)

What, too, of the bryony and hawthorn on the tomb? And why are not the pigs represented to put the matter beyond doubt? There *are* pigs among the carved foliage in the chancel at Childrey. 'The choice of the foliage' is not 'obviously made for symbolical reasons'; the leaf-forms of the maple, the vine, the oak, and the bryony, are the most beautiful of all that grow; and *therefore* they were chosen.

Of the true spiritual meaning hidden in his work, the carver himself was unconscious—otherwise it would not be so well worth searching out. It is the unconscious testimony of the leaves that is important: they are the evidence of the character of the ideas in the minds of men in the early fourteenth century. They tell of a growing civilization, of tranquil life, and peaceful habits, of a new interest in external nature, of that leisured, accurate observation which is the beginning of science, and of a love for what is graceful and tender, which is the inspiration of high and noble art. Compare them with the hawks and war-horses at Iffley, compare too the fidelity of observation shown in the carved hawks with that in the crude unrecognizable flower-forms that accompany them; and then compare the age of Stephen with that of Edward I: therein may be found some real analogies, some profitable field for the exercise of imagination. Then the foliage of S. Frideswide's shrine will suggest, not the barbarian Algar and the swineherds, but the fathers of English poetry and science, Geoffrey Chaucer and Roger Bacon, and knights as tender as they were brave and true.

It is often said that the form of the globular ornaments in the niches of S. Mary's spire was invented in honour of Eleanor, wife of Edward I; the only basis for the sugges-

tion is the synchronization between the introduction of the ornament and the death of the queen. But *post hoc ergo propter hoc* will always be sound logic for some people; for instance, it is usual for guide-books to describe the cross-legged effigies of thirteenth-century knights (of which there are fine examples at Dorchester and Haseley) as the memorials of Crusaders; some ingenious writers will even declare from the position of the knees the number of Crusades in which the deceased took part. The remarks sometimes made in front of one of these tombs must almost make the occupant chuckle in his stone coffin. The truth is that all thirteenth-century knights were represented with legs flexed and crossed, the right shoulder thrust forward, the hand in the act of drawing, or perhaps sheathing, the sword; it was an artistic 'pose' that threw into prominence the massive limbs of the warrior and showed to advantage the contours of his muscles. When in the fourteenth century the flexible chain-mail gave place to plate-armour, a stiffer pose became necessary, and so the effigies of later date lie flat upon their backs; to cross the feet would have been an artistic blunder.

Imagination is a good servant but a bad master: there is scope enough for its exercise in the study of mediaeval architecture, but it becomes ridiculous when it lightly reads the notions of a sophisticated age into the systems of a simpler people. That is the besetting sin even of learned historians, but it is fatal to the right comprehension of the spirit of the past.

How imagination, controlled by reason and knowledge, can see through the stones of a building into the mind and soul of the builder may be read in the famous chapter 'On the Nature of Gothic' in the *Stones of Venice*.

But that is the imagination of the trained reasoner, not the fancy of the irresponsible trifler. Let me illustrate the contrast between a fanciful and a scientific explanation of a structural detail by an example drawn from the study of organic life. Fancy explains the curiously shaped mandibles of the crossbill by the legend that its ancestor perched upon the Sacred Cross and twisted its beak in a vain endeavour to draw out the nails. Science, observing not one fact alone, but drawing its slow conclusion from many patient observations, relates the form of the beak to the food of the bird, and explains that the crossed mandibles are exactly fitted for breaking open the fir-cones, upon the seeds of which the bird depends for food. Which explanation best reveals the infinite mind of Him 'who in wisdom made all things'? No one, I suppose, would now regard the old legend as more than a poetical fancy; but my point is that theories just as fanciful still hold the ground in the study of architecture, misleading many and obstructing the light.

This must be our excuse for halting so long upon the threshold of the chapter.

There are two types of ornament, representing beauty—concrete and abstract. The one consists of forms derived directly or indirectly from actual objects: the other of purely ideal forms. Both types are represented in mediaeval architecture, the first by ornaments copied from, or suggested by, the shapes of real things, the second by the curved surfaces that are cut upon the stonework to modulate the play of light and shade. The alternating convexities and concavities that give contrasting effects of light and shadow are known as mouldings; the imitative forms, whether conventional or naturalistic, may be distinguished as enrichments. In early work, ornament

of the concrete type naturally predominates; as civilization advances, the abstract forms tend more to be preferred. Thus Romanesque architecture, like Assyrian and Egyptian, is mainly ornamented with rude carvings; while in Gothic, as in Greek work, mouldings are numerous and varied.

Of Saxon ornament we know but little; probably because there was very little of it, and certainly because still less has survived. Our only important relic of Saxon architecture is the gaunt and gloomy stronghold of S. Michael's, and of its solitary moulding we shall presently speak; but an attempt has been made to suggest that the choir of the Cathedral is substantially a pre-Conquest building, and as the principal evidence adduced is derived from the ornaments of the capitals, we will make brief reference to examples of Saxon decorative carving outside our own district.

In the church porch at Wantage is a fragment of stone that once formed part of a churchyard cross. It is covered with a curious incised pattern of interlacing circles; similar carving on crosses, known to belong to Saxon times, in the Durham Museum and in other places in the north of England, prove it to be Saxon work. But almost identical patterns on fragments of British pottery and on bronze shields and armlets suggest that this form of ornament was derived from Celtic sources. It thus forms a strong argument for the theory of the survival of a considerable Celtic element in England, especially as its examples are most numerous in those districts that were latest subdued, when the first fury of conquest had abated.

Now on some of the capitals of the Cathedral piers, and particularly on that of the middle pier on the north

side of the choir, there is a pattern formed by interlacing scrolls of foliage.

But, unfortunately for the theory that the scrolls prove the Saxon origin of the choir, they bear a much closer resemblance to the leaf-scrolls of Classic ornament than to any Saxon or Celtic design. Rude imitations of Classic scrolls are common on Norman capitals, and it would be quite possible to get together a series of examples showing the gradual recovery of the design through the eleventh and twelfth centuries, beginning with the font at Deerhurst, on which both Celtic and Classic influence is represented, and ending with the Cathedral piers. Further, it is possible to trace the pattern in later work, as any one will admit who compares the scrolls on the Cathedral capitals with the ironwork on the early thirteenth-century door of S. Thomas's Church. But if those capitals really reproduced a Celtic design, and this were to be taken as fixing the date of the building, it would prove, not that the work was done in 1004 under the influence of a Norman architect, but that it was executed at least two centuries earlier when Celtic influence in art prevailed. Which is proving too much.

No one whose eyes are not blinded by his own prepossessions can fail to see that the caps both of nave and choir are all of one type, however various may be their decorative foliage. They all, both those with scrolls and those with stiff-stalked leaves, have the volute of foliage at their angles that is a certain mark of work done in the last quarter of the twelfth century.

We have no example of Saxon decorative art in any Oxford building.

Norman ornament shows a great variety, but most of it belongs to the concrete type, i.e. it consists rather of

enrichments than of mouldings. In the earlier buildings of the half-century following the Conquest there is very little attempt at decoration. The workmen as yet had not the skill, the tools, nor the models. And though the Norman abbot might rebuild his abbey church, the Norman baron had to build a castle for the king or fortify his manor-house, and secure his holding before he had leisure to turn his attention to the church of the village.

The only graving tool the workmen had was the hatchet with which he squared his masonry; therefore, all early Norman ornament consists of such forms as could be cut by this means. The sunk-star pattern on the imposts of the chancel arch of Holywell illustrates one of the most common of the early forms of ornament, and the only one represented in Oxford buildings. It may well belong to Robert d'Oilgi's days.

But it was when the wise policy of the Lion of Justice had established goodwill between the two races that the wonderful carving that is typical of Norman times was executed. A good deal of it is Byzantine in character, and reflects the influence of the Crusades[1] upon western civilization. Constantinople, of old Byzantium, was then the gateway to the East, and Constantinople was the capital of the Greek Empire, upon which had fallen a double portion of the architectural spirit of Rome. Western Europe had already recovered the constructional principle of the round arch; now it received from Byzantium those ornamental forms that had been held, as it were, in trust until the western legatees should be ready to use them.

So Sir Richard or Sir Roger returned from the East with his head full of designs for ornamenting the new

[1] Or rather the reopening of intercourse with the East which followed the First Crusade.

village church that he had vowed to build if the saints granted him a safe home-coming. And the village craftsman rejoiced with him, and especially over the new tool, the chisel, which should make possible the execution of more delicate and complicated designs.

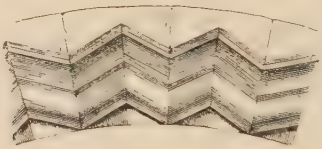


FIG. 99. CHEVRON ORNAMENT

What those designs were can be seen best on the doorways of Iffley, which form practically a complete dictionary of Norman ornament. The most striking features, the signs of the zodiac on the western doorway, the Centaur and the Mermaid on the southern, the leaf-scrolls, and

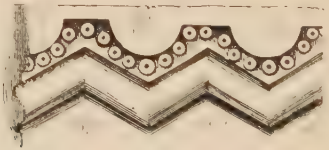


FIG. 100. CHEVRON ORNAMENT

the foliage generally, are Greek in conception, but the treatment and execution are thoroughly native. The beak-heads on the west, found also on the doorways of S. Peter's and S. Ebbe's, are very characteristic of Late Norman ornament. Of their origin little is known. They have been said to symbolize evil spirits waiting at the threshold to pluck away the good seed from the hearts

of those leaving the building.[1] But this supposition is not very complimentary to the dignitaries of the Church, for whom alone the west doorway was opened.

The more conventional enrichments may be particularized, but the illustrations render unnecessary any

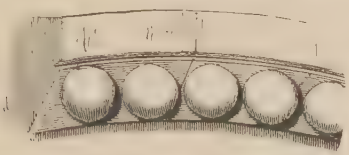


FIG. 101. NORMAN PELLETS (North doorway, Iffley)

description. The chevron or zigzag is the most typical ornament of the Norman style; it was probably derived from Roman work, but its ultimate origin is prehistoric; it is found on the pottery of neolithic man. It was the last Norman ornament to be abandoned by the Gothic

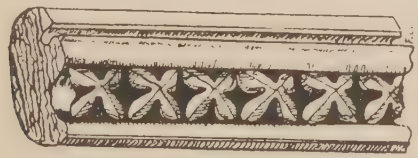


FIG. 102. DOG-TOOTH ORNAMENT

builders, and a very deeply under-cut form of chevron, illustrated in the west doorway of Cuddesdon Church, is one of the marks of the latest transitional stage.

The Nail-head, a small square pyramid, also survived in Gothic work, but changed and beautified by the chisel into the shape of four leaves, forming what is known

[1] Matt. xiii. 4 and 19.

as the dog-tooth ornament ; this is a mark of the earliest Gothic (*c.* 1180–1220), and may be seen on the font of S. Giles's Church, and in the mouldings of the windows of the Chapter House.

The pellets of the north door of Iffley, the billets of

FIG. 103. BEAK-HEADS
Suggesting a possible origin in the wedge ornament (cf. Fig. 76).

the southern string-course of S. Peter's (Fig. 66), and the ubiquitous chevron, though they disappeared from architecture after the twelfth century, were retained in heraldry as charges upon shields ; the arms of the Oxfordshire Dormers, for instance, show ten billets, those of the

FIG. 104. BEAK-HEADS, S. EBBE'S CHURCH

Giffards as many pellets, and those of Wykeham two chevrons.

Among the less common enrichments are the chain ornament of S. Peter's chancel (Fig. 31), the cable-moulding, and the roses of the south doorway of Iffley, and the wedge ornament (Fig. 76), which may have suggested the form of the beak-head.

It should be understood that, though Norman ornaments may be classified under the types mentioned, the execution of the form varies with each example. It must be obvious that the carving on the Iffley doorways, for instance, was never done from a detailed drawing, but from the workman's interpretation of a rough sketch, probably even from his own rude design. So it is full of imperfections, like a child's drawing; but withal it is artists' work, the brain that conceived it moved the hand that shaped it forth. Just as a child's own expression of his idea of a cow is more interesting than his copied

FIG. 105. THIRTEENTH-CENTURY HOLLOW MOULDING

drawing of one, so the Norman carving of Iffley and S. Peter's charms by the very originality of its faults.

Norman mouldings are much less varied than the enrichments of the style; the earliest, which remained to the end the commonest, merely consists of a square projection, the lower edge of which is chamfered off below a narrow groove or quirk (Fig. 70). This is the abacus-moulding on every Norman capital and impost; it is cut upon the imposts of the arches in the belfry windows of S. Michael's, and affords clear proof that the work was done under Norman influence, i.e. at the earliest, shortly before the Conquest.

In late work a bold semicircular bead or torus [1] is the

[1] Also called a bowtell, boutel, or boltell.

commonest moulding; it is cut upon the outer orders of the arch in the Chapter House doorway, and upon the arches in the choir in the Cathedral. This moulding was retained in the string-courses of plain Early Gothic buildings, but before the end of the twelfth century

FIG. 106. BALL-FLOWER ORNAMENT, PRIOR SUTTON'S TOMB (*c.* 1300)

the workmen, having by then acquired a complete mastery of the new tool (the chisel), had developed from it a pointed bowtell or keel-moulding. This is the typical moulding of the transition period (Fig. 71); it is represented in the Cathedral in the arches of the nave. The mouldings of the north doorway in Holton Church,

of the south doorway at Haseley, and of the tower-arches at Cumnor and Cuddesdon, are excellent examples of this date.

The thirteenth-century builders proceeded to cut still deeper into the under-side of the bowtell, so producing the deep hollows that distinguish the Early Gothic mouldings illustrated in the arches of the Lady Chapel and the Chapter House of Christ Church. Mouldings are a much more important feature in Gothic than in Norman work, and enrichments are correspondingly fewer. The dog-

Fig. 107. Fillets

tooth ornament, already referred to, is by far the commonest enrichment of Early Gothic work; it is used profusely in the hollows of the mouldings of the Chapter House. It went out of fashion after the middle of the thirteenth century, and its place was taken by the ball-flower ornament (Fig. 106), which is the characteristic enrichment of hollow mouldings in the Edwardian period. It is often said to be derived from the pomegranate, but it bears a much stronger resemblance to the globular bells on the trappings of pilgrims' mules, represented to-day on the martingale of the cab-horse.

A contemporary but less common enrichment is a four-leaved flower, something like the clematis. It may be seen on the ridge-ribs of the Latin Chapel, in doorways at Dorchester (Fig. 78) and in a beautiful doorway at Bampton, where it is used in combination with the ball-flower.

The mouldings of the mid-Gothic period are not so deeply cut as those of the Lancet stage, the hollows are wider and shallower, and the convex surfaces seldom show more than a quarter of the curve of a circle; if a bowtell occurs its face is divided into segments by fillets, little projecting flat-topped ridges very characteristic of the mouldings of the Early English and early Decorated periods (Fig. 107). The commonest moulding of the mid-Gothic stage is known as the scroll (Fig. 73) because its section bears some resemblance to that of a rolled parchment cut transversely; it will be easily recognized in the hood-moulding of the tower-arches in Merton Chapel. The whole of the mouldings on the capitals, bases, and arches of the tower piers are fine examples of their date (*c.* 1300); the mouldings of the sedilia in the chapel illustrate the beautiful shading that is not the hard black and white of 1250 nor the soft greys of 1350, but is intermediate between them. In the Latin Chapel at Christ Church the scroll-moulding may be seen on the capitals of the vaulting-shafts, and the quarter-round upon the arches. Probably the Latin Chapel is the only building existing in which one can compare completely the mouldings of the Norman, Early Gothic, and mid-Gothic styles without moving from one's seat, or even turning one's head.

After the middle of the fourteenth century the mouldings grew wider and shallower; the ogee curve that had transformed the window-tracery now made its appearance in the mouldings; a broad waved surface became common and remained so through the fifteenth century. Perpendicular mouldings almost always show shallow ogee curves; a very typical form resembles the double ogee formed by the curving pages of an open book before use has made them lie flat. It is illustrated in the mouldings

FIG. 108. CANOPIES OF SEDILIA, MERTON COLLEGE CHAPEL (*c.* 1300)
Showing Decorated foliage and mouldings.

of the north arcade in S. Mary Magdalene Church (Fig. 110). But the most easily distinguished mark of fifteenth-century mouldings is a very wide and shallow hollow dividing one suite of mouldings from another. It is

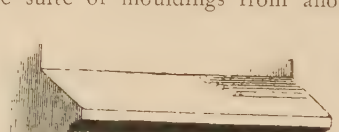


FIG. 109. OGEE MOULDING (*c.* 1350)

particularly noticeable in the window-openings; the glass is protected by being set further back in the wall than in earlier work, and the jambs are scooped out to form shallow recesses. The windows of S. Mary's Church and of Magdalen Tower afford typical illustrations of this wide hollow moulding (Fig. 111)

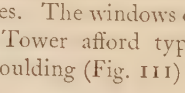


FIG. 110. DOUBLE OGEE, FIFTEENTH CENTURY

I have left until last the most beautiful ornament of Gothic architecture, the carved foliage of the capitals, the bosses, and the spandrels.

There is very little foliage in Norman ornament; what there is is always conventional, and is imitated from Roman models. But towards the end of the twelfth century, when Norman was passing into Gothic, there is evidence

of a strong desire to return to Nature for models in decoration. It is very noticeable in the foliage of the Cathedral capitals; even in the carving of Classical leaf-scrolls the foliage seems to be struggling to take its own wilful curves, and to break away from the perfect symmetry of Greek leafage; in the foliage of the later capitals in the nave there is no attempt at symmetry, the leaves have the freedom and abandon of natural growth. But the builders of the next generation realized that a leaf on a plant is one thing and a leaf applied to architectural ornament is another; they felt that the foliage on a capital

FIG. 111. FIFTEENTH-CENTURY HOLLOW MOULDING

should support the abacus as well as decorate the bell, and so they produced that beautiful leafage of the Chapter House and the Lady Chapel which has all the grace and freedom of nature, and yet has constructional meaning too. Theirs is the perfect capital. Their successors who cut the lovely bosses on S. Frideswide's shrine were so obsessed by the beauty of the actual leaf that they copied it in facsimile in their stonework; it was an amiable weakness; but it *was* a weakness. The carvers of stiff-stalked foliage had loved reality too—we can see it in the bosses of the Chapter House vaulting—but they had self-restraint enough to set construction before ornament. The mid-Gothic artists carved naturalistic foliage on their capitals, disregarding constructional expression in their enthusiasm for botanical accuracy; and the final

result was that the fifteenth-century builders forgot that foliage had ever been constructional, and having no enthusiasm for natural forms, produced the useless, lifeless carving of the capitals in the Cathedral cloisters. The foliage of the fifteenth century partakes of the squareness that marks all the other details; lifelessness follows as a matter of course—the right angle is not found in living matter. All the plant-forms of this period are conventionally treated, but in the early work of the century it is usually possible to identify the natural leaf that furnished the base of the design. Thus on the large tomb in the Lady Chapel, sometimes (but erroneously) spoken of as the Watching Chamber (*c.* 1424), there is a design from vine-leaves and fruit; in the carvings of the sedilia in S. Mary's Church (1488) there is a very similar design, but the leaves are unrecognizable. The cresting of the sedilia canopy, and also that of the contemporary reredos, illustrates a square-leaved ornament that is very common in such positions: it is known as the Tudor-flower, though it is not in the least like a flower, and was in use all through the fifteenth century. It is always used in long suites, and it is possible that it ought to be considered as an ornamental development of the battlement (Fig. 112).

The setting of the door-arch in a square frame produced triangular spandrels (Fig. 113), which had to be ornamentally treated; shields of arms were often used to fill these spaces, as in many of the college gateways, or a panel was sunk in such spandrel, as in the water-gate of Rewley Abbey; but sometimes, e.g. in the spandrels of the archways leading to the Old Schools Quadrangle, a large triangular leaf was carved instead.

The crockets that enrich the outline of Gothic pinnacles

are always derived from foliage. They are not found in Norman work, and are not common in Early Gothic,

FIG. 112. SEDILIA, S. MARY'S (*c.* 1488)

but in the Edwardian period they are used profusely in the canopies of tombs and sedilia, and on the hood-moulds of arches ; there can be few examples as beautiful

as those carved on the canopies of the sedilia in Merton College Chapel. Unlike the other leaf-forms of the mid-

FIG. 113. SCHOOLS GATEWAY

Gothic period the crockets are usually conventionally treated. The numerous pinnacles of Magdalen, S. Mary's,

and the Divinity School bristle with crockets, but, like the rest of the leaf-carving of their date, they are very poorly cut.

The ornaments of the Renaissance period need little notice here, since they are almost all derived from the Greek and Roman Orders already described.

Gothic mouldings perished with the other ornaments of the style in the sixteenth century. They flickered into life again in Oxford under the influence of the Laudian revival, and those of the gateways of University College compare favourably with work of the fifteenth century. The contemporary gateway of the Schools Quadrangle (Fig. 113) also shows very interesting revival of Gothic mouldings; they are so boldly cut that at a first glance they suggest the mouldings of the thirteenth century. But no thirteenth-century builder would have carried them continuously round the doorway; he would have stopped them upon shafts in the jambs, to the great improvement of the design.

Mouldings persisted upon the mullions to the last, or rather *a* moulding, for there was but one type in universal use. The mullion was square in section and had four quarter-rounds cut upon it with wide fillets between them. The Gothic mullion had been formed to resist wind-pressure, and had therefore been made lozenge-shaped in section and with concave faces. But the mullions of seventeenth-century flat-headed windows had to carry a lintel, and hence they were necessarily stouter, and were given a square form with convex mouldings, as in the windows of University and Oriel Colleges and those of the Jacobean houses in Holywell Street, e.g. No. 13.

PUBLIC LIBRARIES
STHNAL GREEN

CHAPTER XIII

ARMORY IN ARCHITECTURE

The heraldry in our ancient buildings is too big a subject to be discussed at the end of a small book, yet no account of architectural ornament would be complete without some reference to the armorial insignia which formed so large a part of it. From the thirteenth century to the sixteenth, shields of arms, crests, and badges both decorated every building and bore witness to its founders. Our churches are full of blank shields that now, like the empty niches, testify to the fanaticism of the destroyer but preserve no memory of the builder.

We have already spoken of the pictorial teaching in the painted walls and windows; scriptural truths formed only one part of the information therein displayed. Above the figures of saints in the window-lights the arms of the givers of the glass glowed in the openings of the tracery; the stone corbels that supported the timbers of the roof were cut into the form of shields and painted with the coats of the founders, the reigning king or the contemporary bishop; the drip-stones of the windows often terminated in similar shields; and on the bosses of the vaulting they were carved again. Every tomb, of course, showed the arms and crest of its occupant, with those of his wife's family and often of his connexions.

Inscriptions, though sometimes added, were superfluous, for few could read them, whereas heraldry was a tongue familiar to all. Nowadays the shield of the sovereign is the only one that most people know, but in the Middle Ages, if you knew the name of a man you knew his shield also; his shield stood for his name, it was his signature,

in a sense his sign manual, for it was reproduced upon the seal with which he stamped all documents whether he was able to write or not—even, indeed, if he had written them himself. So John, though he could write, did not set his name to the Great Charter; he signed it with the shield by which he was known to all his subjects. A written signature might be repudiated or forged, but it was almost impossible successfully to forge a seal.

The instinctive tendency to adopt some private device or symbol as a mark of personal identity is seen in the totems and tatooings of primitive man, mixed up with religious and social notions; in the tokens ascribed by Homer to his heroes; and in the distinctive pennons carried by the figures in the Bayeux Tapestry. But it was the development of armour in the last years of the twelfth century that made such ensigns an absolute necessity to the military chief. The great closed helm which then came into use covered the head and rested upon the shoulders; it therefore became necessary that every leader should assume some distinctive marks by which he might be known to his own men and to the other chiefs with whom he acted. These were displayed in the most conspicuous position, viz. upon the great shield which, until the development of plate-armour in the late fourteenth century, was slung at the breast of every fully-armed gentleman; they were therefore known as 'armorial bearings', or shortly, as 'arms', and the study of their forms, their ownership, and their inter-relations was called 'armory'.

The military co-operation of Christians of all nations in the Crusades made distinctive arms still more imperative. The scorching sun of Palestine forced the mail-clad knights to cover their steel harness with linen surplices

(surcoats) upon which the devices on their shields were reproduced in embroidery. Hence 'shields of arms' began to be known also as 'coats of arms', and their devices as 'coat-armour'.

But the most interesting traces of the influence of the Crusades in armory are to be found in the cognizances adopted by individual Crusaders and borne still upon the shields of their descendants.

All markings upon a shield are known as 'charges'. Setting aside the primitive totem marks, the earliest charges (though this is still a disputed matter) appear to be derived from the structural features of the shield, the stiffening rim, the transverse, longitudinal, diagonal, or crossed braces by which its form was strengthened, and the brazen studs and bosses by which its bull's-hide face was protected. The first inventors of armorial devices seem to have distinguished their shields by selecting certain of these structural details and accentuating them by defining them in one colour upon the face of a shield painted in another. Thus the ancestor of the Harcourts was known by the two golden bars upon the red field of his shield's surface; the arms of Balliol College still show the red shield of their founder charged with a rim of silver; the parti-coloured chevrons of Merton are preserved in the arms of his college; the diagonal brace (bend) painted in black upon a silver shield by the ancestor of Radcliffe may be seen in the hall of University College, and the signboard of the 'Osney Arms' shows two such braces painted in blue upon a gold field, representing the shield of the D'Oilgi's, founders and patrons of Osney Abbey.

These structurally-derived charges are so common that they are known as the 'ordinaries' of armory. Whenever

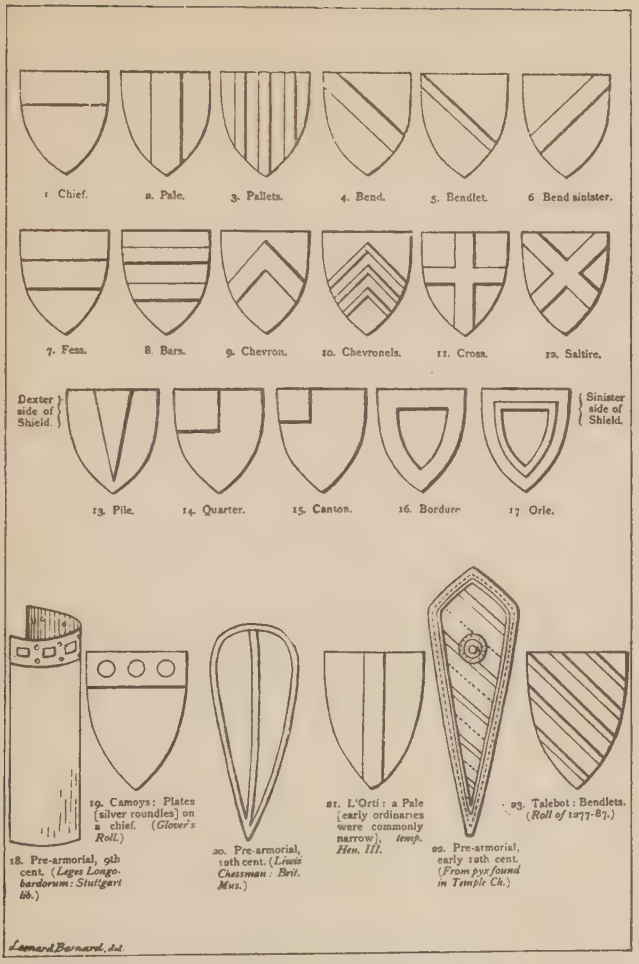


FIG. 114. THE ORDINARIES OF ARMORY.

they appear upon a shield with other charges they are always mentioned first in describing it. They were necessarily so few that their combinations were soon exhausted and new charges had to be sought for. These were found by the Crusaders in forms which would serve at once to distinguish their shields and to preserve the memory of their pious enterprise. So the lion, dweller in southern and eastern deserts, appeared in the west and north upon the shields of the kings of England and Scotland; William the Lion painted a red rampant lion on his golden shield: Cœur de Lion painted two golden lions in the same attitude upon a red shield, but subsequently increased their number to three and bore them 'passant' as we now see them. Lions in various numbers, attitudes, and colours were adopted as charges by many of the barons of Western Europe. Lions' heads and lions' paws were selected by others.

The leathern water-bottles carried by the Crusaders on their marches were also chosen as charges; there are still several inn signs near Oxford painted with this device. Another favourite charge was the scallop-shell, emblem of S. James, Bishop of Jerusalem, and so of all who made pilgrimage thereto. The shield of Villiers in the entry of the Town Hall shows five golden scallop-shells charged upon a red cross by a crusading ancestor of the Earl of Jersey.

But almost from the first the choice of charges appears to have been influenced by a desire to make the device on the shield suggest the name of the bearer. Thus at Cumnor the arms of Forster show three bugle-horns, suggesting forester, the original form of the name; the triple points of the lozenges on the shield of Montagu in the Latin Chapel are a pictorial pun on the older form,

Montacute—the pointed mountain; the arms of Eglesfield show three eagles; and the shields of the Butlers, a numerous clan well represented among Oxford worthies, usually bear wine cups as their principal charge. But perhaps no better example of this type of charge can be found than the Ox and Ford on the shield of our city.

At first each individual consulted only his own fancy in the choice of the device he assumed, but obviously this must have resulted in confusion—'six Richmonds in the field' would be as embarrassing to friend as to foe. A central authority was therefore necessary to register the devices already assumed, to control the assumption of cognizances by new leaders, and to make uniform rules for what must now become an organized science. The officers to whom this duty was deputed were the heralds of the king and the great officers of the realm. The subject of their jurisdiction therefore came to be known as heraldry.

Originally the heralds, as the name implies, had simply been messengers employed by kings and nobles in communicating with friends and foes. But their experience in this capacity had made them specially familiar with armorial cognizances, and so fitted them to act as arbiters in matters connected with the new science. Yet as they were usually uneducated men they fell at first into many absurdities. They knew S. George as a valiant knight who fought under shield, and they supposed that his shield must have borne some cognizance. But as this, unfortunately, had fallen out of recollection they invented it anew, the red cross on the silver field that still forms the principal charge upon the Union Jack. Alfred the Great was a king and a notable warrior (though he did

not fight in a closed helmet) : he must have borne a shield of arms. So this was re-invented for him, a gold cross upon an azure field. And since he is *not* known to be the founder of University College, that body bears his shield, differenced by the addition of four martlets, unto this day.

In spite of these and similar aberrations, the early heralds had reduced their system to a science before the end of the thirteenth century. It is no part of my present business to go into the laws and details of that science. My purpose was only to explain the origin of those armorial forms that are so conspicuous in architectural ornament and which, to those who understand them, add so much to the *human* interest of our old buildings. Incidentally I wished to show that heraldry, so far from being an abstruse and difficult study, is concerned with the symbols of a romantic and picturesque age, was the invention of primitive and simple people, and has no mysteries that cannot be mastered by a very little study of the shields in our college halls and chapels, guided by one of the numerous handbooks available.

A few words in conclusion may be said of the accompaniments of the coat of arms that are often confounded with it. The chief of these were the crest, the badge, and the supporters of the shield. Crests existed long before heraldry and, indeed, before man, for they are found on the heads of many birds and of some animals. There the crest serves the twofold purpose for which it was placed upon the knightly helm : it lends dignity and splendour to the wearer, and it defends the head by attracting blows to itself and so diverting them from it. The comb of the domestic cock is an excellent example, and it is significant that the cock's head, or the head of

one of the fabulous creatures derived from that bird, is very common as a knightly crest. The heads of horned animals are also common—the crest on the helmet of Sir George Nowers in the Cathedral, for example, is a bull's head. Obviously a crest must always represent some form that might naturally be placed upon the helm.

Crests were even more strictly *personal* devices than arms; a woman or a corporate body might assume a shield and grave its charges upon a seal as a distinguishing cognizance. But a crest is inseparable from a helmet, and a helmet is meaningless except in actual war; no woman or corporation, therefore, could or can possess a crest—though a woman, being the heiress of her father, could transmit his crest to her son. It was reserved for the gentry of our own day to remove the crest from the helmets of their forefathers and place it upon the posterior buttons of their footmen.

Some mark by which the retainers of a great house might be known was, of course, necessary in the Middle Ages. But a mediaeval lord would no more have used his arms or crest for this purpose than he would have entrusted to another the defence of his own honour. This want was met by the adoption of badges, emblems not so much of persons as of families. Two famous badges are the bear and the ragged staff, used separately or in combination by the great house of Warwick. The inn sign at Cumnor on which they are represented will be known to every reader.

The fifteenth century was the age of great barons. Magdalen College, founded during the Wars of the Roses (so called, be it remembered, not from any mythical quarrel in a rose-garden, but from the badges worn by the adherents of the rival houses), is rich in examples

of badges used to ornament its buildings. On the bosses of the Founder's Tower may be seen the Shining Sun of York, the Red Rose of Lancaster, and more interesting still, the Rose in the Sun combining the rival emblems. The gable of the buildings facing Magdalen Bridge shows the Portcullis badge inherited by Henry VII from the House of Beaufort. The motto associated with it involves the historic pun 'altera securitas': just as the portcullis formed a second safeguard if the great gates of a castle should be forced, so his mother's descent from Edward III secured the throne to Henry if his own claims should be overborne. In the new buildings Mr. Bodley has employed several Tudor badges in his scheme of ornament; among them may be noted the White Hart, Chained, adopted by Richard II, and used by many of his successors. In the spandrels of the doorway of Jesus College Chapel a very interesting combination of badges shows that the building dates from the time of James I; after his accession to the English throne he used as his badge the Rose of England dimidiated (i.e. halved) with the Thistle of Scotland. Perhaps the most famous badge in English history is that of the Prince of Wales, the three ostrich plumes of the Black Prince, derived, not as in the popular legend from the King of Bohemia, but from his mother's family of Hainault who in turn derived it from the Counts of Ostrevant.

Badges, like other armorial devices, were sometimes pictorial puns. Thus the badge of Bishop Beckyngton at Lincoln College is a fire-*beacon* planted *in* a *tun*. So, too, the family motto often bore punning reference to their name: '*Do no yll*' was the motto of D'Oigli (do-illy), '*Ne vile velis*' that of Neville.

Supporters appeared late in the history of heraldry;

they are figures placed on either side of the representations of shields to suggest protection and display of the arms. Obviously they are the luxuries of peace rather than the necessities of war. The knight carried his own shield in battle, but his squire bore it to the field ; so when he caused its form to be set up in church or hall he gave it added dignity by placing figures at the sides as defenders and exhibitors. These were sometimes men, e.g. the savages that support the shield of Bertie, Earls of Abingdon, sometimes beasts like the Lion and the Unicorn, known to every one as the supporters of the royal shield, and sometimes supernatural agents, as angels, like the shield-bearing figures in S. Mary's Church, or fabulous creatures, like the wyverns that support the shield of Marlborough.

Supporters are the exclusive privileges of the great. The sovereign, peers of the realm, and knights of the ancient orders are, with a few exceptions, alone entitled to exhibit them. Some great corporations (of which Oxford is one, its shield being supported by a beaver and an elephant) are among the exceptions.

The shield of arms, with the crested helmet above, the motto beneath, and the supporters (if any) on either side, form what is known as a hatchment or achievement of arms. After the Reformation the hatchment of the sovereign was ordered to be set up in every parish church in token of the Act of Supremacy. In the church at Stadhampton the shield of Queen Elizabeth still remains, with the motto ' Reginae Nutrices Erint '. Usually when the sovereign demised, his shield was removed and that of his successor substituted. The custom continued down to the reign of George III (probably the reputation of his heir made the most loyal churchwardens hesitate

to set up his shield in their church) and his hatchment still remains in many of our local churches.

Following the example of his sovereign the squire often ordered that his shield should be set up in the village church at his death. At Wood Eaton there are several eighteenth-century hatchments, memorials to departed squires, and at Nuneham and Besilsleigh the custom is still retained. In Oxford, too, the home of forsaken beliefs, it is still the practice when the head of a college dies to set his shield above the gateway, there to remain until his successor assumes office.

CHAPTER XIV

THE INTERIOR ARRANGEMENTS IN MEDIAEVAL BUILDINGS

In the Middle Ages there was only one type of building, and it was made to serve with but slight modifications as castle, house, and church, and even as barn. It is the type represented to-day by the church nave and the college hall. Its adjunct, which was also common to buildings of whatever nature, was the fortified tower. It was only in its interior arrangements[1] that this basic type varied according to the purpose which the building was designed to serve. I shall give a short account of those arrangements in domestic, military, and ecclesiastical buildings.

[1] The ornamental details were, of course, more highly elaborated in churches, but even they were of a single type. Early English foliage may be seen in the shafts of the doorway of Appleton Manor-house, and the ball-flower ornament in the doorway of Fyfield Hall.

I. The Manor-House

The germ or nucleus of the house is the hall; it is significant that the word is still used to describe alike the many-roomed mansion of the rich and the narrow passage into which the front door of the cottage opens.

The earliest English house—we do not refer to the huts of peasants—was a great hall like a church nave. in the centre of the earthen floor was a stone hearth, the smoke from which curled up among the rafters and found its way out by a louvre, such as may still be seen in the roof of Lincoln Hall. The cooking for the household was done either in the open air or in a separate building at one end of the hall; at Stanton Harcourt the mediaeval kitchen still remains; it has no chimneys, and the smoke from its fires escaped by means of shuttered openings in the eaves, opened or closed according to the direction of the wind. At the end of the hall, remote from the kitchen, was a low platform or dais, upon which was set the high table for the lord and his family. The lower end of the hall was the province of the servants and retainers, who took their meals on trestled tables. A door near the dais opened upon an exterior flight of steps leading to an upper chamber, the solar, built against the gable-end of the hall and having below it a storehouse or stable. To this secure and private elevation the lord and his lady with their children retreated at night, leaving their servants to sleep upon the benches or the rushes of the hall.

Such was the 'house' of the Norman baron; and even in the days of Edward I the king and queen gave audience in the solar, seated upon their bed.

In the fourteenth century new needs produced develop-

ments in house-building; the hall was not affected, but the arrangement of buildings at its two ends became more specialized. At the servants' end there grew up kitchens, pantries, butteries, and larders, approached by doors in the wall of the hall; a wooden screen eight or ten feet high protected the hall from draughts from these doors, and a platform above it formed a gallery for minstrels. This relationship between the hall and the kitchens and buttery may still be seen in the older colleges, particularly at New College.

At the lord's end of the hall the solar became subdivided into parlour and bedchamber. Then, as the desire for privacy grew, more rooms were built on at right angles to the hall; and a similar development taking place at the other end, three sides of a square were formed. It only remained to build a wall with a gatehouse on the remaining side and the quadrangular plan of the fourteenth-century manor-house came into existence. This remained general until Tudor times, when cannon made fortified houses futile, and livery laws, by limiting the numbers of personal retainers, made the great hall unnecessary.

In the Elizabethan house, therefore, the hall, though still remaining the central core of the building, was much reduced in size; it was usually approached by a projecting porch in the middle of the front of the house, and this, with the two wings representing the sides of the mediaeval quadrangle, gave an E-shape to the plan which is fancifully supposed to be meant as a compliment to the queen.

Though fireplaces had been common enough in the solars of mediaeval houses, it remained for the Tudor builders to invent the chimney-stack; in the earlier fireplaces the smoke escaped by means of flues in the thickness

FIG. 115. THIRTEENTH-CENTURY FIREPLACE, ABINGDON ABBEY

of the walls, and its vent at their outer face was hidden in the angle of a buttress or turret. There is a fine thirteenth-century fireplace in the ruins of Abingdon Abbey, which has a lofty turret above it with concealed openings for the escape of the smoke. But when domestic architecture became definitely differentiated from ecclesiastical the necessity for chimneys was openly acknowledged in building; they were added to the fireplaces in older houses; it was at this time that the tall chimneys of All Souls were built.

One proof that Late Gothic was not a debased style is the artistic treatment of the new feature. People who live in houses topped by groups of drain-pipes should not cast reflections upon the builders of the Jacobean chimney-stacks.

II. The Tower

The early castle differed from the manor-house only in the greater importance of its strategic position and in the greater strength of its defences. A castle was simply a house, exceptionally well fortified. Down to the end of the eleventh century its principal defence was the moated mound with its wooden stockade surrounding a circular area at the summit, within which the great hall of timber was built. Early in the twelfth century the castle hall was constructed of stone, and defended, not by a stockaded mound, but by a great stone tower or 'keep' built near it. In the fourteenth century similar towers were built in the wall that encircled the castle yard. At Oxford these were destroyed when the castle was 'slighted' after the Civil War, but the Norman keep still remains and is typical of the mediaeval tower.

Its immense walls of rubble are so thick that no battering of mediaeval artillery could seriously damage them; its only door was twenty feet from the ground, and when the wooden stair by which it was reached was removed it was impregnable, and its garrison could only be reduced by starvation. The basement space below the first floor was reached by a trap-door and served as a storehouse. The first floor was used as a hall, and the floor above as a chamber for the women. In later keeps small private chambers were made by hollowing the thick walls; fireplaces were similarly made, the smoke escaping by flues in the wall. In times of peace the keep served as a private dwelling for the lord and his family, to which they might retire from the crowd in the great hall. It safeguarded the Norman family in the midst of an alien and conquered race, and enabled a handful of Normans to dominate the town or district that formed their holding.

FIG. 116. CHIMNEY TURRET, ABINGDON ABBEY (*c.* 1250)

The top story of the tower and its flat roof were the scene of defensive operations when the castle was attacked. The arched openings in its four faces were closed by wooden doors, hinged at the bottom, which dropped outwards to form platforms, so that men standing upon them could drop stones, boiling water, or molten lead upon the heads of those who tried to plant scaling-ladders against the wall or to attack its base with pickaxes. Later in the twelfth century the parapets of towers were pierced with holes for projecting beams to support a wooden gallery for the same purpose. But this was sometimes set on fire by the besiegers, and in the thirteenth century overhanging galleries, carried on corbels, were built of stone, having holes called machicolations pierced in their floors.

In the north face of S. Michael's tower, i.e. on the side most exposed to attack, is an arched opening like those in the top story of the castle; it is thirty feet from the ground, and its purpose, like theirs, was to give access to a projecting platform. The tower of S. Peter's as it exists to-day shows in most of its details the work of the fifteenth century. But since the original church was built by Robert d'Oilgi and was always regarded as guarding the city on the east:

Invigilat portae Australi Boreaeque Michael,
Exortum solem Petrus regit atque cadentem,

there must have been a Norman tower, and the very marked 'batter' or inward slope of its walls, in which it resembles the castle, suggests that the present tower, in spite of subsequent alterations, is substantially a part of the original fortifications of Oxford though it does not stand upon the actual line of the wall. New College

tower with its loop-holed and windowless lower stories is obviously designed mainly for the defence of the wall from which it projects. But the other towers of Oxford have little that is distinctively military about them, though they could always be used as temporary strongholds, impregnable to anything short of siege artillery.

III. The Church

The church stands upon land either given by some Saxon thane or Norman lord, or else once forming part of the open space round which the houses of the Saxon hamlet clustered, and on which the folk-moots and the markets were periodically held. In the former case church and manor-house are usually near neighbours, e. g. Holywell; in the latter the church stands in the central area from which the streets radiate, e. g. S. Martin's, Carfax.

The churchyard was entered by a lych-gate, sheltered by a timber roof, beneath which the bearers rested for a moment in carrying a villager to his last sleeping-place. Few lych-gates remain—there is one at Garsington—but the little modern gateway of S. Martin's at Carfax serves to remind us of them. The church always stood on the north side of the churchyard, as is well seen at S. Giles's and S. Mary Magdalene; primitive people were susceptible to the influence of light and shade; they shuddered at the idea of burial in the shadow of the church.

We have seen that the principal entrance to the building was by the south door. Near it (as at Headington) stood the cross, raised upon steps, symbolical of Calvary; sometimes it stands still upon the very spot where the missionaries of Augustine or Birinus planted their wooden

crosses and first preached to the sons of Woden the Gospel of Christ, and Him crucified. In the Middle Ages the parson seldom preached, and never unless he had something to say; then, as a rule, he stood on the steps to deliver his message, for pulpits were very rare until after the Reformation. The outdoor pulpit at Magdalen reminds us of the ancient practice.

In the church porch parish business was transacted, and parts of the baptismal and marriage services were conducted; it was provided with stone seats, and contained a stoup for holy water in which the entering worshippers dipped their fingers. The Norman stoup at S. Peter's has been hacked away, but its traces remain, and recesses for stoups may be seen at S. Giles's Church and All Souls Chapel. The room above the porch, sometimes called the parvise, was used by the priest or sacristan, or possibly in some cases was the cell of an anchorite. After the Reformation it was often utilized as a parish library; for every church was obliged to possess certain specified books defining the doctrines of the Protestant faith.

The font stood either in the porch or immediately within the church door, for the unbaptized had no right of entry. Its form and ornaments varied with the architectural fashion of its date.

Early fonts were frequently square, and were usually supported on pillars; the Norman font at Iffley and the Early English font of S. Giles's are good examples. S. Peter's font is a modern imitation of a Norman form of which an original example may be seen at Radley. Plain tub-shaped fonts, standing on great square plinths, were common in parish churches in the twelfth and thirteenth centuries; there are specimens at Cowley and

Elsfield. After the thirteenth century the chalice form became the most usual; the cup was polygonal, and its six or eight faces were panelled with blank tracery, or carved with shields of arms. The font of S. Mary Magdalene belongs to the middle of the fourteenth century, that at All Saints', which came from S. Martin's Church, is a little later. Fifteenth-century fonts are smaller than those of earlier dates, for the original practice had been totally to immerse the unfortunate infant; the font of S. Michael's will serve as an example.

Inside the church the most striking object was the great carved screen that separated the nave from the chancel. The nave had many secular uses in the Middle Ages; it seems to have served most of the purposes of a parish room; its floor area was free from seats, except for stone benches round the walls—which may still be seen in Merton Chapel and Cuddesdon Church; and in it were kept various articles of public property; the firehook, with which the thatched roof of a burning cottage was pulled bodily off to prevent the spread of the fire, the public coffin, in which the bodies of the villagers were carried to their graves—for wood was not wasted on coffins for the poor, the arms which every village was bound to provide according to the number of its able-bodied men, the whip of the functionary who drove out the dogs, the long wand of the sluggard-waker, the ducking-stool for militant females, and even the copper pot in which beer was brewed for the 'church ale', a mediaeval method of raising funds by the sale of ale brewed by church workers. The screen, therefore, had an important significance.

It was usually made of oak, but occasionally of stone,

as at Balking; its top formed a platform, the Rood-loft, from which parts of the mass service were said or sung; and it supported the great Crucifix or Rood from which screen and loft took their names. All the roods and most of the rood-lofts perished at the Reformation, but many screens still survive, though mutilated.[1] In the church of the Cowley Fathers all has been revived, even to the replacing of the organ in the rood-loft, and the practice of singing anthems from its platform. The worn condition of the steps by which the rood-loft was reached, and which still exist in most of the village churches, at Iffley for example, is evidence of the constant use of the rood-loft in the Middle Ages.

The walls were covered with painted illustrations of Christian truths; over the chancel arch was a representation of the Last Judgement: the dead arising naked from their graves; on one side, the gates of hell wide opened for the wicked, with Satan and his demons dragging them in; on the other, the just, looking upward; and above, Christ throned in glory. Opposite the church door was a fresco showing S. Christopher bearing the Infant Jesus; before this the intending traveller prayed to be safeguarded on his journey, that he might come home again in peace. In the splay of the windows were painted the pictures of the saints, and the glass itself set forth their story.

Even good Protestants may view with regret the coats of whitewash that cover these pictures, and the cold print of the creed and ten commandments that replaced them after the Reformation. In Oxford itself funds have been

[1] There are fine fifteenth-century examples at Church Hanborough and Charlton, and one of the thirteenth-century at Stanton Harcourt.

found for the modern restorer to scrape whitewash, plaster, and pictures together from the walls; but in the

FIG. 117. WALL-PAINTING, SOUTH LEIGH
S. Michael weighing a Soul.

village churches traces of mediaeval colouring may still be seen; the restored wall-paintings at South Leigh are almost as famous as the stained glass of Fairford. There

are faint traces of frescoes on the ceiling of the Chapter House.

The pulpit may almost be said to be a post-Reformation institution, though there are mediaeval examples at Hanborough (in wood) and Combe (in stone); these, however, belong to the fifteenth century, and are probably due to the influence of Wicliffism. Pulpits may be said to date from the reign of Edward VI, when all churches were ordered to be so provided. James I re-issued the injunction evidently with more effect, for pulpits of his date are still very numerous. That in the Cathedral is a fine example. In many churches the nineteenth-century craze for Gothic resulted in the destruction of the Reformation pulpits, and their replacement by stone ones with Gothic details such as may be seen in S. Mary's. The high pews with which church naves were furnished after the Reformation were also destroyed by the Victorian restorers, and replaced by the modern seats on the model of the benches introduced into a few churches in the fifteenth century.

In the chancel the principal feature was, of course, the high altar. This was always of stone in the Middle Ages, and was marked with five crosses symbolical of the Five Wounds. Behind it was the carved reredos, with its canopied recesses and figures, of which New College and Magdalen possess unequalled examples. At S. Michael's the fifteenth-century reredos of the high altar has been moved to the chapel; that at S. Mary's still remains, but has been much mutilated. Where there was no carved reredos there was often, as in the south aisle of Holywell (Fig. 56), niches or brackets for the figures of the Blessed Virgin and S. John, witnesses of the Sacrifice commemorated at the altar. In order that

worshippers in the aisle might view the elevation of the Host at the high altar a hole, called a squint, was cut through the wall at the side of the chancel arch. At Haseley there are squints giving sight of the altar from both aisles of the church.

Fig. 118. Squints at Haseley

An ever present accessory to the altar was the small drain, called a piscina, in the south wall, in which the chalice was washed after the celebration of mass. Its arched recess, moulded according to its date, usually contains also a stone shelf or credence upon which the sacred vessels stood. These, when not in use, were kept

in a locker, a stone cupboard in the thickness of the wall; its wooden door has usually disappeared, but the iron staples for hinges often remain, and the hole into which the bolt was shot. The presence of piscinae in other parts of the church, e.g. at the east ends of the aisles, as in S. Giles's, proves that altars once stood near; all through the Middle Ages it was the custom to leave money for the endowment of chantries, i.e. altars at which masses might be said for the souls of the testators. The priest so supported was usually not he of the parish, but one who lived by celebrating masses in chantries, a 'mass priest'. Some chantries were supported by guilds for the good of the souls of departed members. There are traces of half a dozen chantries in Kidlington Church.

South of the high altar are three canopied seats—sedilia, in which sat the celebrant and his assistants. Those at Merton are among the most beautiful examples in England. In the opposite wall was often another canopied recess, the Easter Sepulchre, in which the Crucifix of the high altar was hidden on the evening of Good Friday, to be brought out again with high ceremonial on the morning of Easter Day. There is a fine example at Stanton S. John. The sanctuary is usually divided from the western part of the chancel by a low carved railing. This is generally of seventeenth-century work, for Archbishop Laud issued an order that the altar should be fenced off with rails 'so close together that dogs might not pass between'; these are copied from Classic models; often they are twisted like the columns of S. Mary's porch. Cumnor has fine examples of rails, pews, and pulpit of this date.

In the chancels of many village churches, e. g. Cowley (Fig. 97), there is one feature which has never yet been

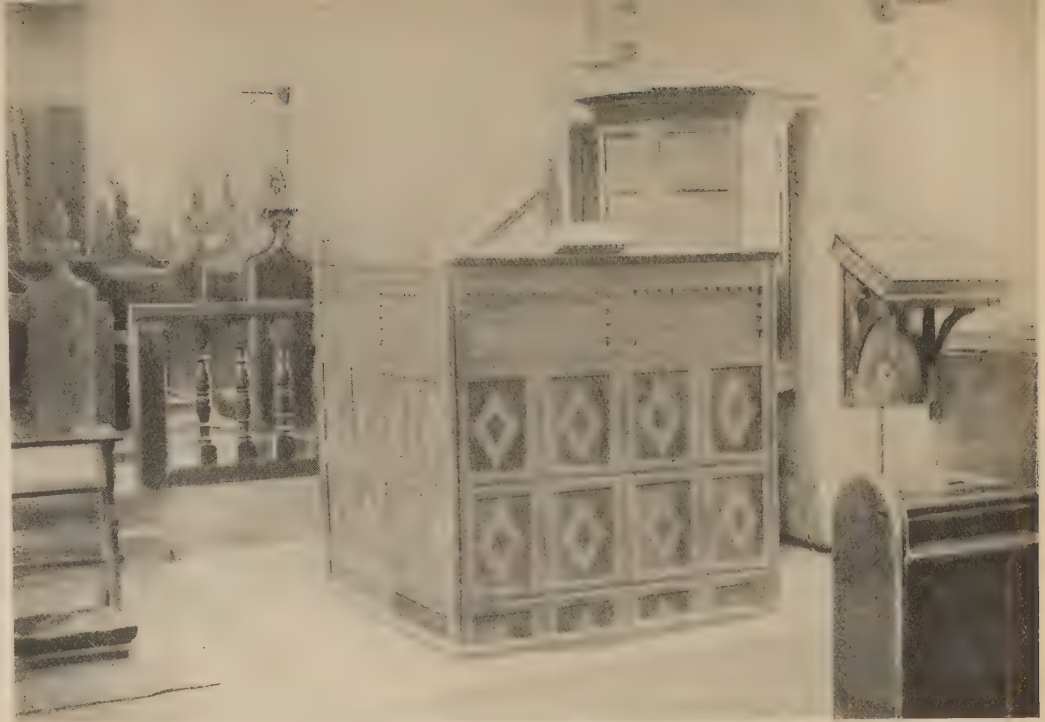


Fig. 119. Seventeenth-century Woodwork, Cumnor

satisfactorily explained ; it is a small low window in the south-west corner, which shows by the hinges in its jambs that it was closed by a shutter and not glazed. It was once believed that such windows were used in communicating lepers ; but lepers were not permitted even to approach the villages, and moreover, these low-side windows are so common that some more general need must have brought them into existence. What that need was no one knows. Mr. Christopher Markham in his monograph on the subject has examined fourteen theories, and has given reasons for discrediting them all. The subject still remains the 'Sphinx of Archaeology' ; but the blocked low-side window at Elsfield with its book-rest cut in the jamb seems to point unmistakably to its use in some service in which the officiating priest was inside the church, and the worshipper or worshippers without ; a low-side window at Wigginton, which has a canopied seat in its jamb, points to the conclusion.

On the north-western pier of S. Giles's tower may still be seen a large cross painted on the face of the stone. It marks one of the points at which the building was anointed with oil by Bishop Hugh of Lincoln when he consecrated the church in the time of Cœur de Lion. There were twenty-four of these crosses on the stonework of every mediaeval church, twelve within and twelve without ; sometimes they were carved, as on the southern jamb of the west doorway at Iffley, but they must usually have been painted or they would scarcely have perished so completely.

The tombs in our ancient churches have a great wealth of interest, artistic, historical, and heraldic, but I can here only give a very short account of the marks by which the date of a monument may be judged. The earliest

tombs still remaining in local churches belong to the thirteenth century. At this time the stone coffin was generally sunk into the floor of the church and covered either with a slab of stone or Purbeck marble, on which was cut a large floriated cross enriched with Early Gothic foliage, or with a cross-legged figure of the deceased, in the chain-mail of the period, with kite-shaped shield, and with sword half-drawn from the sheath. There are examples of floriated grave-slabs in the Cathedral, and of mailed knights at Dorchester and Haseley.

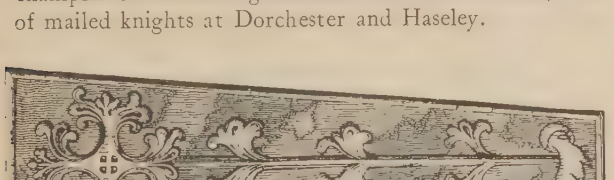


FIG. 120. FLAT GRAVESTONE, GREAT MILTON, OXON. (*c.* 1250)

Before the end of the thirteenth century the altar-tomb became the most common type; a stone table was raised above the grave and upon its flat top, which actually formed an altar at which masses were celebrated for the salvation of the departed, rested his effigies; the figures were sometimes carved in stone as in the tomb of Sir George Nowers (1425) in the Cathedral, but more often were cut out of plates of a metal called laten, a mixture of copper and tin; they were then let into the face of the stone and fastened with pitch and rivets; Adam de Brome's tomb in S. Mary's, from which the brass has been torn, will illustrate the method. The finest brasses in Oxford are in the floor of the ante-chapel at New

College, and commemorate some of the early Wardens. The earliest brass is that of Warden Bloxham, 1387, in Merton College Chapel.

FIG. 121. TOMB, WATERPERRY, OXON. (*c.* 1400)

Brasses and altar-tombs remained in fashion until the middle of the seventeenth century, but after the Reformation, when pews were everywhere introduced into churches, the mural monument became the most common

type. A half-length figure of the deceased was set up in a recess in the wall above his marble gravestone in the floor. Shakespeare's monument at Stratford is an example known to every one. There are similar monuments in S. Mary Magdalene and S. Michael's Churches, in the transepts of Merton (Figs. 57 and 69), and in the Cathedral.

In the eighteenth century most monuments were fixed to the walls, and generally consisted of a large white marble slab on which was engraved a long Latin eulogy of the dead man, sometimes surmounted by an urn or a bust. The monuments of the Spencers at Yarnton are the finest examples in the district.

The poor were buried in the churchyard, and their graves are seldom marked by any permanent memorial. But in the sixteenth century, as the wealth of the nation increased, the rise of a lower middle class is seen in the churchyard stones bearing dates of Elizabeth and James. These are much thicker than modern tombstones; their tops are cut into ogee-curves, and they are sometimes 'decorated' with skulls and cupids, or with festoons of fruit and flowers in the debased Classic taste of their date. There are good examples in the churchyard of S. Peter's, and others at Iffley, Cowley, Headington, and indeed in every ancient churchyard.

The inscriptions on tombstones open a wide field of interest to the antiquarian—but I have already wandered far from the province marked out in the preface, and have strayed from architecture into archaeology. I will quote but one sentence, from an epitaph in North Hinksey Church, which may not be out of place at the end of this book: 'Reader, look to thy feet: honest and loyal men are sleeping under them.'

INDEX

Abacus 24, 30, 152
Abingdon 193, 270
Abutment 34, 131
Acanthus 30, 151
Adderbury 215
Akeman Street 20
Aldrich 78
Alfred 261
All Saints' 78, 99, 231, 275
All Souls 40, 79, 99, 122, 171, 195, 269, 274
Altar 278
Altar-rails 280
Appleton 151, 266
Apse 43, 76, 94
Architects: Barry, Sir C., 86; Blomfield, Sir A., 88; Bodley, Mr., 88, 214; Buckler, Mr., 86; Butterfield, Mr., 86; Champneys, Mr., 88; Cockerell, Prof., 30, 84; Hare, Mr., 88; Hawksmoor, 78; Jackson, Mr., 88; Jones, Inigo, 74, 231; Palladio 74, 76, 231; Rickman 56; Vanbrugh, Sir John, 78; Waterhouse, Mr., 86; Wren 76, 131, 135, 231; Wykeham 99, 103, 223, 244
Architrave 22
Arms, 257
Arris 24
Ashmolean 21, 22
Ashmolean, Old, 231

Badges 263
Balliol 70, 102, 138, 258
Ball-flower 247
Baluster 198
Bampton 247
Base 157
Basement-course 183
Battlements 168
Beak-head 242
Beckley 97, 148
Besilsleigh 266
Bicester 152, 199
Billets 179, 244
Blenheim Palace 78, 80
Bloxham 215
Boss 118
Botanic Gardens 74
Bowtell 245
Brasenose 76, 171, 195
Brasses 283
Brick 175
Broughton 215
Butler 261

Camera 41, 78, 184
Capital 148
Carrel 102
Cassington 201
Castle 49, 52, 270
Cathedral 39, 43, 52, 58, 62, 65, 98, 100, 113, 116, 128, 142, 145, 151, 154, 164, 171, 193, 204, 208, 215, 219, 234, 239, 246, 247
Ceiling 171
Chancel 95, 278
Chantry 280
Charges 258
Charlton 276
Chevron 242, 258
Childrey 236
Chimney 269
Chinnor 213
Christ Church: Canterbury Gate 80; Dome 78; Hall 68; Library 100, 231; Meadow Buildings 86; Stairway 68, 122
Clarendon Building 22, 26, 78, 138
Clear-story 106
Clifton 148, 158
Cloister 100
Combe 278
Composite Order 32
Corbel 164, 182
Corinthian Order 30
Cornice 22
Corpus Christi 170
Cowley 129, 138, 150, 188, 228, 274, 280
Coxwell 168
Credence 279
Crest 262
Crocket 252
Crypt 43, 98
Cuddesdon 133, 151, 243, 247
Cumnor 74, 138, 186, 234, 247, 260, 263, 280
Curtain-wall 166
Cusp 212

Dais 267
Dentils 28
Divinity School 66, 99, 125, 130, 135, 174, 193, 224
Dog-tooth 60, 243
Doilgi 49, 54, 258, 264
Dome 41, 160
Dorchester 171, 193, 214, 223, 237, 247
Doric Order 25
Drip-stone 177

Easter Sepulchre 280
Eaves 164
Eglesfield 261
Elsfield 95, 151, 204, 275, 282
Entablature 21
Ewelme 104, 148, 175
Exeter College 70, 84, 86, 125

Fairford 277
Fillets 28, 248
Foliage: Corinthian 30; Stiff-stalked 153; Naturalistic 154, 234, 250; Square 155
Font 274
Forest Hill 186
Forster 260
Four-leaved flower 247
Frieze 22

Gable 161, 170
Gargoyle 165
Glass 219
Guttae 26

Hanborough 276, 278
Harcourt 258
Haseley 157, 213, 237, 247, 279
Hatchment 265
Headington 186, 273
Hertford 32, 88, 232
Hinksey 138, 228, 285
Holton 151
Holy Trinity 88, 232
Hood-mould 177

Iffley 108, 126, 129, 142, 145, 150, 157, 161, 164, 177, 192, 201, 224, 274, 276, 282
Inns 104
Ionic Order 28
Islip 148, 151

Jackson, Mr., 88
Jesus College 86, 171, 228, 264
Joseph's Stone 20

Keble 86, 176
Keel-moulding 179, 246
Kettel Hall 136, 195
Kidlington 174, 280

Label 177
Lancet 202
Laten 283
Leigh, North, 20
Leigh, South, 277
Lewknor 213
Lincoln College 32, 70, 230, 232, 267
Lintel 16
Locker 280
Long and short work 126, 174
Louvre 267
Low-side window 282

Machicolations 272
Magdalen 68, 79, 88, 173, 185, 195, 225, 230, 264, 274, 278
Mansard 170
Marston 228
Merton 32, 62, 76, 88, 102, 120, 129, 155, 158, 160, 165, 177, 180, 182, 193, 213, 217, 219, 228, 254, 275, 284
Metopes 26
Milton 109, 193, 215, 283
Montagu 260
Mouldings 238
Mullions 224
Mutules 26

Nave 95, 275
New College 65, 79, 130, 148, 156, 185, 222, 224, 268, 272, 278, 283
Noke 228
Northmoor 136
Nowers, Sir G., 279
Nuneham 266

Orders, the, 24; Corinthian 30; Doric 25; Ionic 28; Tuscan 28; Composite 32
Oriel College 70, 170, 183, 230, 255

Panel 184
Parapet 164
Parvise 274
Pediment 161
Pellets 243
Piddington 212
Pilaster 36
Pinnacle 66, 123, 129, 173
Piscina 279
Pole 224
Porch 274
Portcullis 264
Pulpit 274, 278

Queen's College 40, 76, 78, 161, 184, 195

Radcliffe 170, 258
Radley 274
Reredos 278
Rewley 252
Ribs 113; Wall-ribs 118; Ridge-ribs 118; Tiercerons 120; Liernes 120
Romsey 108
Rood-screen 275
Rubble 174
Ruskin 86

S. Aldate's 99, 217
S. Andrew's 89, 230
S. Barnabas 88, 94
S. Clement's 84, 232
S. Cross, Holywell 52, 98, 148, 154, 186, 241, 278
S. Ebbe's 52, 188, 243
S. Giles's 60, 98, 145, 154, 159, 180, 181, 193, 204, 205, 209, 212, 214, 223, 244, 273, 274, 280, 282
S. John's College 183, 195, 228
S. John the Evangelist 123, 214, 276
S. Martin's 212, 273
S. Mary Magdalene 65, 99, 129, 148, 157, 158, 168, 193, 217, 250, 273, 275
S. Mary the Virgin 65, 68, 132, 157, 172, 213, 214, 250, 252, 278
S. Michael's 46, 49, 126, 148, 166, 174, 198, 214, 216, 239, 272, 278
S. Mildred's 103
S. Paul's 30, 84, 94
S. Peter in the East 52, 65, 95, 97, 98, 108, 113, 150, 154, 161, 164, 179, 186, 192, 201, 204, 215, 216, 223, 242, 244, 272, 274
S. Peter le Bailey 88, 218
S. Thomas's 138, 190, 240
Sandford 201
Schools, New, 88
Schools, Old, 32, 195, 255
Scroll-moulding 180
Sedilia 248, 252, 280
Sheldonian Theatre 76, 231
Silchester 95
Solar 267
Spandrel 252
Squint 279
Stadhampton 265
Stairs 170
Stanton Harcourt 267, 276
Stanton S. John 212, 214, 280
Stoup 274
Sunningwell 74
Supporters 265
Sutton Courtney 175 186, 202
Symbolism 233

Tidmarsh 95
Tiles 176
Tombs 282
Town Hall 88
Tracery 206
Transom 65, 220
Triglyphs 24
Trinity College 79, 88
Tudor Flower 252
Tuscan Order 28

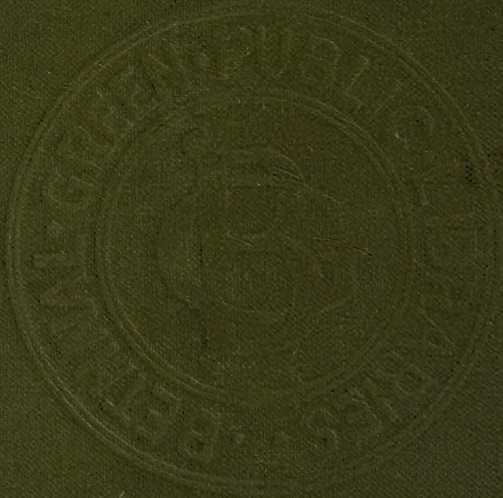
University College 70, 86, 88, 102, 170, 183, 228, 230, 255, 262
University Museum 86, 88, 233
University Press 32, 94, 110

Villiers 260
Volute 28, 152
Voussoirs 140, 231

Wadham 32, 39, 68, 70, 74, 183, 228, 230, 232
Wall-painting 276
Wantage 239
Waterperry 134, 284
Widford 20
Wiggington 282
Witney 134
Wood Eaton 171, 181, 204, 228, 266
Woodstock 207

Yarnton 70, 285

METROPOLITAN BOROUGH OF ... PUBLIC LIBRARIES

Oxford: Horace Hart, Printer to the University

MAR 1926